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**SOUTHWESTERN
ARCHAEOLOGY**



One end of Kiet Siel Ruin in Kiet Siel Canyon, a branch of the Tsegi Canyon system, in north central Arizona. This is a large Pueblo III cliff pueblo.

SOUTHWESTERN ARCHAEOLOGY

By

JOHN C. Mc.GREGOR



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PREFACE

This book has resulted from the need, often expressed by teachers, laymen, and students, for an organized framework upon which the individual interested in Southwestern archaeology may build. The subject is advancing so rapidly, and so much detailed information is now at hand that in general only the broadest outlines may be presented. The center of Southwestern culture is considered in greatest detail, outlying cultures hardly at all, and those most peripheral are omitted. It is hoped that such a review of the information and literature at present available not only will be of immediate value but also will serve as a stimulant for more complete organizations of the subject later.

Although certain portions are given in detail much still remains in nearly outline form, as it was first prepared and presented to students. A short bibliography of the most pertinent literature has been included with each chapter, those works which the writer feels to be of the greatest importance being starred. These short bibliographies include comments concerning the material found in each report which bears on the subject discussed. At the end of the book is a much more complete general bibliography, which will serve to supplement that already suggested.

Only the most important features of each period or culture have been stressed, so that a fuller picture may be achieved by additional reading in the short bibliographies. Since this book is designed as an introduction, and not as a final and complete compendium on the subject, much choice has been exercised, and a great deal of detailed material omitted.

The first part presents a theoretical and general background, the principles of which may be successfully applied to archaeological work in any field. This forms a necessary base upon which later detailed data may be arranged, for the aims and methods of archaeology must be understood before results may be evaluated. The second part is an historical reconstruction of the prehistoric Southwest. There are summary chapters on each culture wherein it is evaluated in the light of its history and achievements. Thus, for a rapid view of the material in this section the summaries might be read first, or the average reader wishing only a broad understanding of Southwestern archaeology could most profitably read in order the introductory chapter, the various culture summary chapters, and the last general summary chapter. In-

terest in tree-ring dating has been so widespread that many individuals will probably also wish to read this chapter.

Southwestern archaeologists have never forgotten that their aim is the reconstruction of history, and as a result have directed their researches along these lines. Tree-ring dating has done much to make this aim possible, for it has supplied absolute dates in terms of our calendar to a great many ruins. It has also been possible to extend these dates over larger areas by what is herein termed the "seriation process." Most archaeologists have felt that art evaluation of objects, and similar studies, is a phase of the work to be done later, from the material which they have collected and preserved in institutions.

Theoretical interpretations of data have been kept at a minimum, for in any event they are subject to much criticism. Broad and basic interpretations which bear directly on an understanding of historical processes and interrelationships have been pointed out, as it is only in this way that cultural influences and development may be comprehended.

The writer wishes to acknowledge the aid and stimulus received in this work from the members of the faculty of the University of Chicago, the staff of the Museum of Northern Arizona and that of Gila Pueblo, co-workers in the Southwestern field, and students and friends. Specific appreciation is expressed to Dr. H. S. Colton and Dr. T. J. Tormey for critical reading of the manuscript, to Dr. Emil W. Haury for similar examination of those chapters dealing with Hohokam, Mogollon, and Salado, and to Dr. H. P. Mera for reading and criticizing the chapter on the Rio Grande.

J. C. MCGREGOR.

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Part I
Background

Chapter I

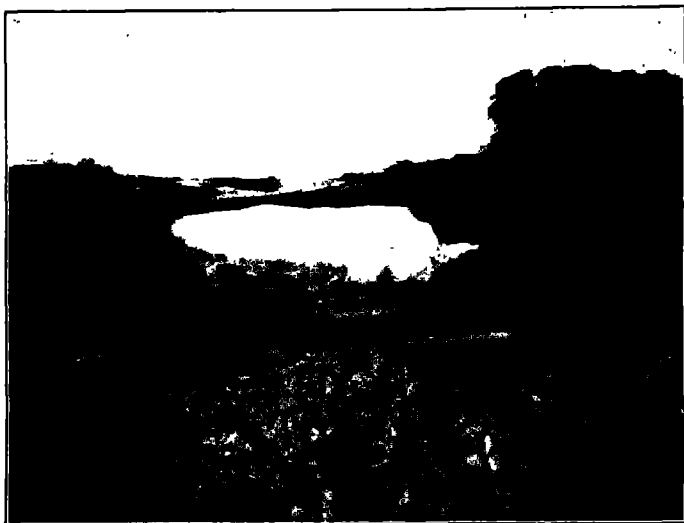
INTRODUCTION

Archaeology is not the romantic subject of modern fiction, but it does hold much satisfaction for those who have made it a subject of special inquiry. There is always a trace of mystery shrouding the lives of past individuals, and to delve into these ancient histories generally results in new concepts and appreciations of past events. To those of sufficient vision it is possible to perceive, among the clouds of stirred-up dust, something of the character and achievements of the people who composed the prehistoric tribes, and at the same time to attain a better understanding of the processes of history when it is thus extended farther back in time.

The Southwest has from the first proved a fertile field for the development of common misconceptions, and perhaps some of these should be corrected immediately. The prehistoric Southwesterners were neither exceptionally small nor exceptionally large, nor were they physically superior to the average Indian of the Southwest today. They were not accomplished engineers, but rule-of-thumb workers, even in the creation of such pretentious structures as massive cliff dwellings, huge ball courts or vast ceremonial chambers, and extensive irrigation ditches. On the whole they were neither more nor less than average human beings attempting to secure their survival in the struggle for existence.

When the Southwest is pictured the archaeology is most commonly thought of as great structures. Picturesque cliff dwellings, unique to this section, are probably best remembered of all, particularly the square or round towers and fine masonry of the Mesa Verde in Colorado, or such sites as sprawling Betatakin and Kiet Siel in their breathtaking Arizona settings. Next to these in impressiveness are the huge open sites in Chaco Canyon and Aztec Ruin in New Mexico, Casa Grande in southern Arizona, or a thousand more similar villages. Even the cavate dwellings, such as those in Frijoles Canyon, or Old Caves, vividly impress the tourist.

These sites, however, represent only a very small portion of Southwestern prehistory, for by far the greater part of the archaeology still lies most inconspicuously buried. The average individual has much difficulty in locating these ancient homes, but generally the presence of small broken fragments of pottery scattered about on the surface of the ground is of help. If a site choice made now is investigated ancient house remains will often be found, for the same factors which determined choice then control it today.



Natural bridges of various sorts are more common in the Southwest than is generally known. This one was found in the northeast corner of the state.

1. A GENERAL STATEMENT OF SOUTHWESTERN ARCHAEOLOGY

The aim of the archaeologist is to make the past understandable and informative in the light of the present. To do this it is necessary to convert prehistory to history — to bring to light unrecorded past events and make of them an alive and dynamic historical account of what happened in the past, and why it happened. The historian is interested in the same ends, and is concerned with the same elements of the same story, as the archaeologist, but the historian has written records from which he may arrive at his conclusions; the archaeologist has not.

Both deal with three elements: events, place, and time. The historian arranges his events, or occurrences, in the proper place group and the

proper time sequence, and then he has a history of that place and time. But he must do something more if he is to have a history from which lessons may be drawn and future acts more intelligently directed. He must interpret these events.

The archaeologist, confronted with these problems, must also understand how events came about, and explain them. It is in the interpretation of facts that the most difficult problems of archaeology arise. They must be interpreted correctly, for speculation, or wishful thinking, can play no part in this reconstruction if a true understanding of the past is ever to be achieved. Both the historian and the archaeologist should recognize that history in the making is a dynamic, complex, ever-shifting pageant, and should so present their findings.

When archaeology is mentioned many people immediately think of the Old World, or Middle America, where finds have perhaps been more publicized or make a greater appeal to the imagination of the average individual. These fields, however, are not the only fruitful ones, for the Southwest is in many respects even more informative.

Half a century of capably collected information concerning the archaeology of the Southwest has accrued to the present. Most well-directed and carefully thought out research has been done within the last few years, but all has been of a relatively high order. Not only has research been well done; this field offers unusual opportunities of recreating history in two additional particulars. First, an unusually complete, more or less chronological, sequence, from exceedingly simple to very complex remains, is found here. This means that it is possible to examine with some reliability what might be called "cultural evolution." The second important point is that actual dates, in terms of our own calendar, are available for all well-known periods. Tree-ring dating has made this possible, particularly in northern Arizona and New Mexico. One chapter of this book is devoted to a discussion of the history, application, achievements, and limitations of this method.

Early in archaeological work here, and still to some extent in other fields, expeditions have been directed to the collection of remarkable museum specimens, even though a maximum of information might not be secured. The more recent tendency is to dig smaller sites than were investigated in the past. These small sites are most often sufficiently simple that the story they hold may be quite easily read, whereas the larger sites are so complex that their story may be obscure. Small sites were also generally occupied for a shorter time, thus making any dates

derived from them more accurate, since houses were not so commonly rebuilt and beams reused.

The non-logical "logic" of human activities complicates the task of the archaeologist, so that like the detective of popular conception he must have some knowledge of a great many fields, to secure every possible intelligent aid in the solving of past histories. Such fields as biology, chemistry, physics, geology, geography, history, psychology, and such less basic subjects as physiology, anthropometry, ethnology, physiography, ceramics, tree-ring studies, and many others are of the greatest direct aid.

At present Southwestern archaeology is changing rapidly. As information is gradually accumulated toward one end additional data are uncovered modifying research and altering conclusions before they are fully reached. Even so it is possible at any one time to summarize and present what at that time constitutes the most acceptable evaluation of known facts, even though these conclusions will probably be altered with the accumulation of more information. Before a brief summary of prehistoric history is presented, certain concepts should be clarified.

Culture, in the sense in which it will be used here, does not mean refinement. It does mean more nearly the average, conventional activities of the group considered. Any group which may be isolated either geographically or in time may be considered distinctive culturally when the total culture of that group is markedly different from the total culture, or means of doing things, of any other. The greater these differences, the more basic to the lives of the people, the more basic the group. The largest and most basic of these cultural groups in the Southwest are referred to as roots.

Smaller cultural divisions form branches, being the various developmental series which have sprung from roots. Branches are composed of a series of sites which may be grouped together to form a time or evolutionary sequence. They are also confined to certain sections, usually occupying much smaller areas than roots. Here branches will not be discussed in detail although one or two must be mentioned.

The smallest division which is commonly made, above the individual site, is the focus, or phase. This unit is composed of several sites all of which have essentially the same culture, and hence are of the same time, and must be in at least approximately the same geographical area.

The archaeological unit which might be considered the Southwest should include, at the most, Arizona, New Mexico, the southwestern

half of Colorado, most of Utah, the southern tip of Nevada, perhaps the extreme southeastern edge of California, and an undetermined amount of northern Mexico. Throughout all this section the culture is more like that of the center than like that of any other known area. It may therefore be considered a unit. The actual center of Southwestern culture, as now understood, is probably best represented along a line between Arizona and New Mexico from the four corners (Arizona, New Mexico, Colorado and Utah) south to the Mexican border. This is fortunately also the best-known portion of the Southwest, and it happens to be nearly the center of the section suggested as including the maximum spread of this culture.

In following chapters the center will be considered first and later the outlying portions will be compared to it. It must be remembered that all details upon which proof of the theses suggested in this summary rest will also be found in the following chapters. In this eastern Arizona and western New Mexico section all known major stages in the development of the prehistoric Southwesterner are represented. Other developments are, as now seen, variants of these basic patterns. Though movements are recognizable at various times in the past the most consistently outstanding culture area seems to have been in this center until almost historic times, when the greater numbers of Pueblo people moved east toward, and into, the Rio Grande River valley.

Primitive people undoubtedly did not recognize boundaries to their domain other than those imposed by nature, with the result that there was constant interchange and spreading out of influence. Contacts between groups of diverse backgrounds seem to have been much more abundant in the Southwest than has been formerly suspected, and isolation of any group almost non-existent. Natural environment, however, did affect this development somewhat.

A glance at Fig. 1 will show that the Southwest may easily be divided into two major sections by an intermediate physiographic zone. The two major sections are the plateau and the desert, while separating them, like a long carelessly dropped chain, is the mountain section. This also separates the plateau and the desert from the high plains to the east, and seems to have formed an indefinite culture hindrance, if not a barrier, in this direction.

Not only are these several physical provinces obviously marked, but also each is most characteristic of one broad class of prehistoric remains. To some extent this differentiation is a result of the restrictions imposed

on the people by environment. This is particularly apparent in such features as the building of homes of adobe where rocks suitable for building are lacking, or the development of irrigation ditches where natural precipitation is too scanty to make farming possible otherwise. Of all these provinces it has recently become increasingly apparent that the most important in human development is the mountain section.

In almost every respect the mountain section is intermediate between the plateau and desert. It is also the home of what now appears to have been the earliest, or at least one of the earliest highly developed, cul-

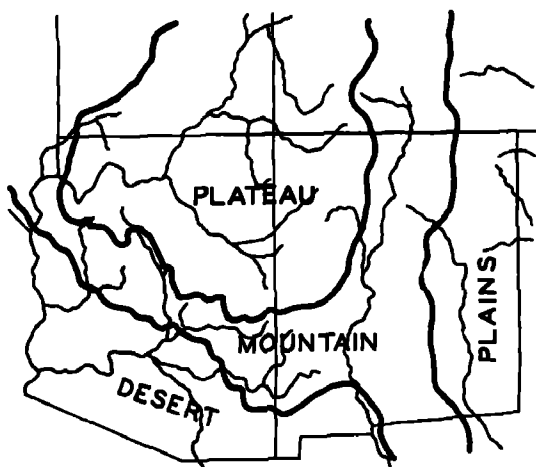


FIG. 1. The major physiographic divisions of the Southwest. Most important are the plateau, mountain, and desert. The plains section is outside the area of purest Southwestern culture. The center of the area is a wide line along the Arizona-New Mexico border between the four corners and the Mexican border.

tures of the Southwest. These first people though relying mostly upon hunting for subsistence were also collectors of plant foods and probably lesser agriculturists. From them came style and fad influences, to shape and direct other people and their histories. Later their own vitality became exhausted, and they were in turn influenced by the very groups they had helped form.

This important group is now referred to as people of Mogollon Culture. They were originally confined to the mountain section and seem to have most flourished in the mountains between Arizona and New Mexico. Because of the basic importance of this culture it is known as

the Mogollon Root. A similarly basic culture is the Basket Maker Root. Possibly as early, or nearly as early with a comparable culture level, it began its history in the plateau section of the Southwest, apparently somewhere near the four corners.

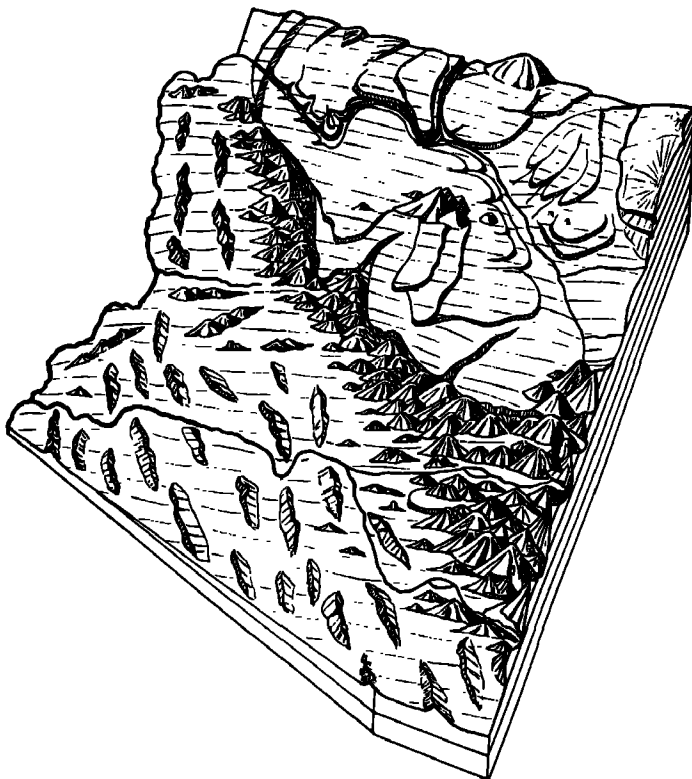


FIG. 2. Block diagram roughly illustrating the general topography of the state of Arizona. The three major divisions of the Southwest, the plateau, mountain, and desert sections, are even more obvious in this state than in New Mexico, into which all three extend.

Present evidence now suggests that both these groups were well established in their respective quarters by about the beginning of the Christian era, but with an earlier more primitive Mogollonlike ancestor known from southeastern Arizona. At about this date a third more or less basic group developed, possibly as a modified offshoot of the Mogollon. These people made their homes in the desert section, and had a

culture sufficiently distinctive to place them in a separate category, the Hohokam Root.

Recent research along the Colorado River in western Arizona has brought to light an additional distinctive group, the Patayan Root. Much remains to be learned about these people, most recently admitted, and least studied, but what is known shows them so markedly different from other roots as to be a definitely separate group.

Some archaeologists would be inclined to include Pueblo Culture with Basket Maker as "Anasazi," but in the eyes of this writer it should not be so considered. It has most likely developed from a Basket Maker origin as modified by Mogollon contacts, and hence is a different sort of cultural division. There is a tendency to make still further root distinctions, but most of these are also found upon serious examination to be more nearly variants of the roots here mentioned than antecedent forms of them.

Once these divisions are established it is possible to consider them in the light of historical sequences. Individual groups of people, or tribes, are apparent, and various types of cultural groups are also identifiable. In the briefest possible manner the history of the Southwest might be summarized as follows.

About Fifteen Thousand Years Ago

Outside of the immediate Southwest the earliest cultures are represented by stone artifacts found in open sites and scattered widely over a number of states. In the high plains, at Raton, New Mexico, the first Folsom points were found in situ. These are specialized projectile points with chipped grooves down each face. From various other portions of New Mexico and Arizona other early, or at least typologically primitive-looking, stone implements have been found, and all these may be roughly grouped together at the present time and considered very early in American history, perhaps some fifteen thousand years old. Little is known directly of these people, either physically or culturally, particularly in the Southwest, but widespread serious projects of investigation are gradually bringing more and more to light concerning them.

About Ten Thousand Years Ago

The first well-represented culture now known from the Southwest proper is the Cochise, or Cochiselike Culture, investigated by Gila Pueblo and most recently by the University of Arizona, and reported

by various members of these institutions in science meetings and elsewhere. It is found in southeastern Arizona. Most recent work tends to demonstrate that it is ancestral, and directly related, to Mogollon Culture. Cochise Culture may be roughly dated as ten thousand years old. It, too, is known almost wholly from the stone objects found in campsites, and one cave, occupied by these people. Grinding stones are a very characteristic feature, as opposed to the chipped stone objects of the Folsom complex.

Sometime B.C.

Possibly from this early beginning a primitive pottery bearing culture developed in this section and in southwestern New Mexico. In the earliest stage it had pottery but none was decorated with painted designs. Stone objects were similar to those of the Cochise Culture, but in many other traits it was directly ancestral to the later well-known Mogollon Culture.

About A.D. 1

The Mogollon Culture proper was well established by about the time of Christ. It seems to have been about equally divided between hunting and agriculture. In some characters, such as the use of a large round house early in their residence in the Southwest, drills, and heavy corner-notched projectile points, it is suggestive of plains cultures. At present, however, there is not enough evidence of such a contact to make it more than worthy of note in passing.

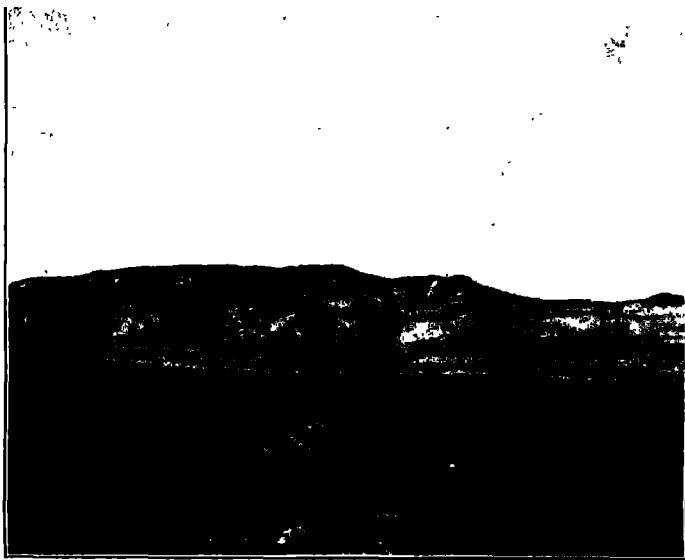
Physically the Mogollon people were not like the Basket Maker people of northern Arizona and New Mexico. Present evidence indicates that they had more or less rounded heads, which tended to be high, and were occasionally flattened somewhat in the back, perhaps by the early use of a cradle board. This type is characteristic of the later Pueblo People of the north, whereas the Basket Makers seem to have been longer headed, generally with a marked medial crest and longer faces. Although no tree-ring dates are as yet available on the earliest Basket Makers, there is some evidence suggesting they too may eventually prove to be about as old as the time of Christ.

About A.D. 400

By about A.D. 400 three basic cultures, or tribes of people, were well established in the Southwest. The Basket Makers were settled in the

north or the plateau area; the Mogollon people were completely differentiated from their ancestors who had developed the Cochise Culture in the mountain section; and in the desert the Hohokam were definitely individual and well marked from the Mogollon.

People with Mogollon Culture were living in pithouses, or houses of single rooms dug below the surface of the ground, and were practicing an economy about equally divided between hunting and agriculture.



A view of the Lukachukai Mountains in northeastern Arizona. The many box canyons cutting into these mountains may be seen. It is in such locations that natural caves have formed shelters.

Stone carving and stone working was already well under way, but most of the arts were not particularly outstanding. Pottery was probably their best early achievement; it is characterized by rather fine thin red or buff types. Disposal of the dead was by inhumation, in which the body was loosely flexed.

In the north, or the plateau, Basket Maker Culture though similar in some respects was markedly different in others. The houses were exceedingly crude shelters, although more elaborate storage cists were made and used. Agriculture was primary, but was supplemented to a high degree by hunting. Though no pottery was made, basketry was in

wide use, and the atlatl and atlatl dart, a light throwing spear, were used instead of the bow and arrow. Ornaments were common, and though simple were quite varied, particular stress being placed on the use of feathers. Clothing consisted of square-toed sandals, breech clouts or fringed skirts, and feather and fur robes. Rather loosely flexed inhumation of the dead was characteristic. On the whole the Basket Maker Culture of this time is one of the most characteristic cultures of any period in the Southwest. Fortunately many of the remains of these people are found in the northern dry caves, so the picture of the perishable materials of which the culture was made is more complete than with most other groups.

Hohokam Culture, flourishing in the desert section, had become quite definitely differentiated from its parent culture, Mogollon. The economy was based almost solely on agriculture, which in turn was dependent upon irrigation. The homes these people lived in were long pithouses with rounded ends and lateral entrances. Pottery types were a fine red and a plain buff; in lesser amounts there was a red-on-buff decorated pottery. Interesting human figurines made in clay are somewhat suggestive of those of Mexico. Chipped and ground stone work was excellent, particularly an outstandingly well-made long-bitted axe which had a raised ridge about each side of the three-quarter groove. Ornaments of shell and bone were also exceptionally well made and abundant. Disposal of the dead was uniformly by cremation, so that nothing is known concerning the physical type of these people.

About A.D. 700

Three hundred years later, or about A.D. 700, the same three groups were still represented in the Southwest, but were certainly, at least by this time, augmented by the Patayan Culture to the west along the Colorado River. Unfortunately even yet too little is known about this group to make it possible to characterize them very thoroughly, for they are mostly known by their distinctive ceramic complex.

At this time people with Mogollon Culture were exerting considerable influence on other groups, particularly expanding northward and modifying the culture of people who lived in the plateau section. The house was still a pithouse with four posts supporting the roof and a side entrance, and the economy was about equally divided between agriculture and hunting. The pottery showed considerable improvement over previous types; it consisted of a plain red, a plain buff type, and a

simple red decoration on a light brown background. Stone work, on the whole, seems to have been better at this time, though never so outstanding as that of the true desert dwellers. Disposal of the dead was by flexed inhumation.

In the plateau, Basket Maker Culture was undergoing radical changes, probably as a result of the strong Mogollon influences which were spreading northward. Physically the people were changing from a long head to a more rounded one, and the first pottery, houses, the bow and arrow, beans, and perhaps cotton were being introduced. Unlike the pottery from other sections this new ceramic effort produced pots which were either gray, black-on-gray, or black-on-white. Flexed inhumation was still practiced. These were the traits which by their addition to pure Basket Maker Culture finally produced what must be considered a different complex, the Pueblo Culture.

Hohokam Culture, like Mogollon at this time, was highly developed, possibly reaching near its peak. Characteristic features are the presence of huge ball courts, extensive irrigation systems, and excellent shell and ground stone work. Houses, as was true of all Hohokam Culture, were still long pithouses with lateral entrances and more or less rounded ends. Pottery was plain buff, and red-on-buff, but considerably specialized from the preceding types. Carved stone vessels, palettes, and mirrors, the last suggesting similar objects known from Mexico, were all outstanding carved stone work. Many of the arrow points were remarkably long, slender, and well made, often with deep serrations along the edges. Both shell and bone were carved in cutout and full round styles, and were about as well done as any ever produced here. Cremation was still the only method of disposal of the dead.

About A.D. 1000

By about A.D. 1000 the pattern of the three basic cultures already described had been considerably modified. Mogollon Culture had definitely passed its peak and was beginning to wane as a separate entity. The house was still a four-post pithouse, but the general economy had shifted away from hunting to a more sedentary type. The pottery was also changing from the previous red-on-brown types to a red-on-cream, or a black-on-white series which was developing in the south. This was soon to evolve into the well-known Mimbres Culture there. Most marked alteration in Mogollon Culture was the obvious Pueblo influence which was affecting it from the north.

At the same time Pueblo Culture, outgrowth of what appears to have been a Basket Maker and Mogollon cross in the plateau section, had not only appeared but had become fixed as a definite pattern. This was especially developed in the eastern portion of the plateau area, where huge stone houses above ground, and of several stories, were already being built. The economy of these people had standardized as essentially agricultural, and the pottery had developed to an equally rigid pattern of gray corrugated and black-on-white types. Both stone work and ornaments of stone and shell, cutout and used as inlays, were well made, but not the most outstanding produced. More tightly flexed inhumation was the most common method of disposal of the dead.

Hohokam Culture represents a more even continuation of preceding stages. The houses were still long oval pithouses. Great irrigation projects were characteristic, but the more abundant ball courts were much smaller than those of the preceding type. Pottery also was a continuation of the preceding, but there was a marked tendency for the production of fabric designs rather than the common earlier conventional life and geometric forms. Figurines of clay were still being made, but they now consisted only of heads which had hollowed backs and were probably placed on sticks or otherwise supported. Ground and chipped stone objects were still on the whole remarkably well made, particularly exotic forms of arrow points. A most interesting feature of this southern culture was the inclusion of cast copper bells, made locally by the lost wax method. Disposal of the dead was still by cremation.

About A.D. 1300

At about A.D. 1300 several important events occurred in the Southwest. Most striking of these was the great drought which struck just at the end of the thirteenth century. This markedly affected all the plateau, and to a lesser degree other areas. As a result of this twenty years of continuous minimum rainfall, people of Pueblo Culture abandoned all the northern portion of the plateau and migrated south and southeastward. As they moved out from their original central plateau home they pressed other surrounding people still farther, resulting in a series of shifts, much like a falling pack of cards, which reached at least as far as the middle Rio Grande valley and the middle Gila River areas.

What remained of Mogollon Culture was completely overshadowed by Pueblo Culture, to which it was being subjected. As a result of

Pueblo domination, Mogollon was changing in southwestern New Mexico into what was soon to become Mimbres Culture.

As has been suggested, Pueblo Culture had left its original home in the north and moved to the southeast. It did not move in these directions without alteration, however, for it was changed or modified by every local group with which it came in contact. Most of the works of art and the general culture carried through this period with little major change.



Turkey Hill Pueblo in the Flagstaff section has walls made of boulders, for it is in the mountain area. This pueblo grew by the addition of units in two lines facing a common court.

To the south, Hohokam Culture was in no way outstanding. Probably the most interesting feature of this time was the fact that these people lived peacefully in contact with the Pueblo people, in many cases actually occupying the same village site. They clung tenaciously to most of the basic features of their own culture, living in pithouses even though the Pueblos were then occupying adobe compounds, and cremating their dead when the Pueblo people practiced inhumation. They

also refused to modify their basic ceramic industry, still producing red, buff, and red-on-buff pottery, when the accompanying Pueblo people were making the much more colorful and striking polychrome pottery which characterized them in this section.

What became of these several groups, or tribes, still remains in part something of a mystery. It has already been suggested that the Mogollon people moved south and developed into the Mimbres group, and there is some evidence that these in turn moved still farther south into northern Mexico, but what then became of them is somewhat uncertain. Some of the Pueblo Indians, the Hopis of northern Arizona and the several groups of Pueblo Indians of the Rio Grande valley, are obviously descendants of the Pueblo people who remained in the north or moved east into New Mexico. What became of those Pueblo people who moved far south is less certain; perhaps some of them returned north when conditions there were once more favorable. The ultimate fate of the Hohokam is shrouded in even greater mystery. Possibly they moved west to the Colorado River, where they are represented today by the Yuman Indian groups, or remained in the Gila and Salt River valleys as Pima or similar modern groups, or they may have moved south or north to become absorbed or dispersed by other people.

About A.D. 1600

Three hundred years later, by about A.D. 1600, with the beginning of written records, the present pattern of occupation and all the present tribes were established, with the possible exception of Papago and Yaqui Indians in the extreme south. Of considerable interest is the postulated time of arrival of the nomadic Indians, the Navaho and Apache. Probably they arrived nearly at the same time, for the early Spaniards noted both and applied the same name to both of them. They were certainly present in the Southwest by A.D. 1600 and began a very rapid rise, particularly the Navaho Indians.

From about A.D. 1700 on, they were a serious menace to the Pueblo Indians, and before that date they had been the cause of many pueblos moving to places of better protection, such as the tops of mesas, where they have remained since. In northern Arizona the only Pueblo people were the Hopi Indians, who now occupy practically the same sites they inhabited at this time. The type of life which they lead is so similar to the type they were living three hundred years ago that it is almost indistinguishable, with the exception of additional objects of European cul-

ture. This is also true of most of the other Pueblo groups now found in New Mexico.

Farther east, in western New Mexico, the Zuñi and Acoma Indians occupied, and still occupy, a position intermediate between the Hopi and the New Mexico pueblo groups. The last Pueblo Indians to the east are found along the northern half of the Rio Grande River, the most northern and eastern pueblo of which is Taos, well known for the American artists who have repeatedly painted it. Prehistoric and modern life in all these villages was much alike.

In the north the Navaho Indians occupy most of the plateau country, while scattered throughout the mountain section are the Apaches. The occupants of the Gila and Salt River drainages of the desert are the Pima, Papago, and Yaqui Indians, with a sprinkling of Maricopas recently moved east from the Colorado River. It is just possible that some one of these groups are the modern descendants of the Hohokam people, original occupants of the desert, but so far as research now indicates there is no proof of this. Along the Colorado River proper the tribes which belong to the Yuman-speaking group of Indians are found. North and eastern representatives are the Walapai and Havasupai, possibly descendants of the ancient Patayan people. Far to the north, in Utah, are the Utes and Paiutes, quite possibly direct descendants of the very ancient Basket Maker Indians of the plateau, for even today their culture is strongly suggestive of these old people.

For a brief diagrammatic summary of these cultures see the following figures: 27, 65, 144, 155, and 162. In these the relationship of the various cultures (roots and branches), is shown, as well as two charts indicating the rise and fall of several traits in both the desert, Hohokam, and the plateau, Basket Maker and Pueblo Cultures. The last chart is one showing maps of Arizona with the cultures discussed and their directions of influence indicated.

Such, in the most general possible terms, is the reconstructed history of the prehistoric Southwest. In this series the most complete details are known about the later groups, the most incomplete history of the earlier. Earliest occupants are the people with Folsom and Cochise Cultures, semi-nomadic bands. Cochise seems to have developed shortly into Mogollon Culture, one of the strongest early groups. These in turn migrated into the desert section, perhaps combined there with other people, and took some traits from as far away as Mexico to become the Hohokam. At the same time, or a little later, another group was either

introduced into the Colorado River area, or the Hohokam people moved into this section and took on still another type of culture, the Patayan. Little is known in detail about this basic root, except that it is different from the other known groups. What became of all these people in late prehistoric times still remains an open question.



An example of the heavy adobe walls characteristic of the compound structures found in the Gila area. This room is in one of the compounds at Casa Grande.

In the plateau section, at about the time of Christ, the Basket Maker Culture became established and developed into what is probably one of the most distinctive and purest cultures found in the Southwest at any time. Later it was strongly influenced from without, probably by the Mogollon people. With many modifications to the basic culture, and with many additions, even to a new physical type, it became Pueblo. Late in the prehistory of the Pueblo people they moved southward, only a few stopping in northern Arizona, many going to the mountain section south and east, and a few southwest to the Gila and Salt Rivers. To the east, large groups moved into the northern Rio Grande section and intermediate regions, and the most northern group, the Taos Indians, and the most eastern, the Pecos Indians, were in contact with the plains.

II. GEOLOGY, PHYSIOGRAPHY, CLIMATE, FLORA, FAUNA

As has been pointed out, it is possible to divide the Southwest into four physiographic divisions. These are the plateau, the desert, the mountain, and the plains sections. The last is of little major importance to any discussion of archaeology, but the other three are of extreme importance in understanding the environment which affected Southwestern cultures.

The plateau, extension of the great Colorado Plateau, is an area of relatively flat-lying sedimentary rocks (sandstones, limestones, shales, and occasional conglomerates). Although they are nearly flat they tend to dip gently down as they extend northward, so that, though elevation may be lost in going through some portions in this direction, more recent rocks are progressively traversed. The most commonly exposed rocks are of either Permian or more recent age.

Scattered about over the plateau, particularly in the southern half, are areas which are covered by widespread lava flows, and cinder and lava cones. The great San Francisco volcanic field, which centers at Flagstaff, is an example. The northern half is made up predominantly of sandstones and shales, of which the bright red cliff forming Navaho and Wingate sandstones are the most prominent.

The desert section is composed of high block-faulted mountains, with huge basins formed between these ranges, which are filled, sometimes to great depths, with such eroded materials as sands, gravels, and clays. The mountain ranges tend to have a northwest-southeast trend, with the steep faces in any direction. The rocks of which they are composed range from very early, often metamorphosed, hard rocks (quartzites, gneisses, and schists), through unaltered sedimentary rocks to relatively recent lava flows, and great series of volcanic tuffs.

The mountain section, both between the plateau and the desert, and between these and the plains, is intermediate in most characteristics, being largely of either volcanic or erosional origin. The high plains are huge gently sloping accumulations of erosional material swept out from the Rocky Mountains.

Physiographically the plateau is deeply cut by the Colorado River (which forms the Grand Canyon in Arizona) and is widely drained by the Little Colorado River. This latter stream has formed a great basin-like valley which rises from it in every direction. Deep cutting of these rivers and their tributaries has resulted in the sculpturing of the sand-

stones into the mesas and box canyons so widely recognized as typically Southwestern.

Southern Arizona is cut by only one stream, the Gila, which with its tributary the Salt furnished the major erosional agent of the entire desert section. Typical features are the lava-topped mesas and large Piedmont slopes, but the box canyons characteristic of the plateau are entirely absent.

The mountain region combines some of the features of both the plateau and desert but is largely made up of erosional mountains. Valleys are typically of the mountain type, rather narrow, and commonly with abundant streams. This is an area of rugged topography, often with considerable altitudinal variations between valleys.

The average annual temperature variations of the Southwest are controlled more by altitude than by location, that of Flagstaff at 7,000 feet being 45.4, and Yuma with an altitude of 141 feet being 71.9 degrees. Though the entire Southwest may be considered somewhat desertic, Yuma, the lowest point and with the least annual rainfall, has 3.25 inches, while most places of 6,000 feet or more have 20 inches or more. Aside from the mountains most of the desert country has 10 inches or less rainfall, a condition similar to the desert sections of the Little Colorado valley.



FIG. 9. Diagrammatic section of Arizona from the southwest to the northeast corner, showing block-faulted mountains and alluvial-filled valleys of the desert, eroded mountains of the mountain section, and dipping sedimentaries of the plateau. This represents roughly the path of the moisture-carrying winds as they cross the state and is a typical section of western New Mexico as well.

The prevailing storm-carrying winds over Arizona and the western portion of New Mexico are southwesterlies, which transport moisture from the Gulf of California or the Pacific coast. In eastern New Mexico many of the storm-bearing winds come from the east or southeast. As a result of the wind direction most of the rain in the plateau section falls upon the porous rocks of the mesas and higher mountains, there either to run off, forming small intermittent streams, or to filter through the sandstones to issue as seep springs. As human occupation of any

given locality in this country was largely determined by the presence of an adequate domestic water supply, the population was often clustered about such springs.

In the desert section the chief source of water was the permanent streams, such as the Gila and Salt Rivers, or in the small canyons cutting the higher mountains where streams were fed by summer rains or melting winter snows.

The intermediate mountain region, as a result of the more abundant rain and snowfall, had a greater number of permanent streams, which winding through rich alluvial valleys formed ideal locations for agriculture. This more certain growing of crops made a simpler existence possible but was limited to small isolated tracts, none of which could be at too great an altitude (not more than about 7000 feet) to permit a sufficiently long growing season.

Like rainfall and temperature, the flora of the Southwest is, to a great extent, controlled by altitude. In a very general way the following altitude divisions conform to the suggested types of plant life.

ALTITUDE, FEET	PLANT LIFE
10,000-8,500	Spruce and Douglas fir
8,500-7,000	Yellow pine
7,000-6,000	Pinyon and juniper
6,000-3,500	Open country composed of:
6,000-5,000	Sagebrush, rabbitbush, etc.
5,000-4,000	Grassland.
4,000-3,500	Sage, salt bush, etc.
3,500 down	Typical desert, cacti, mesquite, etc.

In specific instances this classification does not hold true, for, in sheltered spots in deep canyons, types of trees such as Douglas fir may be found at much lower altitudes than normally. In the plateau the pine, pinyon, juniper, sagebrush series prevails, but to the south the transition from pine to oak to grassland is probably more typical.

Because of their ease of mobility and adaptability the larger mammals of the Southwest do not conform closely to regional distinctions. In the heavier forest areas the big mule deer and the elk were most at home, while mountain sheep ranged through this zone from the highest altitudes to the open cactus-filled valleys of the desert. In the most open country of both the north and south whitetail deer were found, and in the southern deserts the big gray variation of the mule deer. Antelope ranged throughout most of the truly open regions of deserts and plains,

and in all these zones the predators, mountain lions, wolves, coyotes, and foxes, followed the other game.

Rodents seem to have been more confined by the effects of altitude. Rabbits of several species, including both jacks and cottontails, ranged widely throughout the Southwest. Beaver originally frequented most of the streams, even extending their range well into the deserts of both the plateau and the desert sections. Tree squirrels were plentiful in all timbered sections, while various species and subspecies of pack rats, ground squirrels, gophers, and mice were characteristic of almost every zone, and the kangaroo or jumping rats and mice were found in the desert stretches.

Though one is likely to expect little of bird life in the Southwest an amazing variety and some abundance are found. The larger birds, like

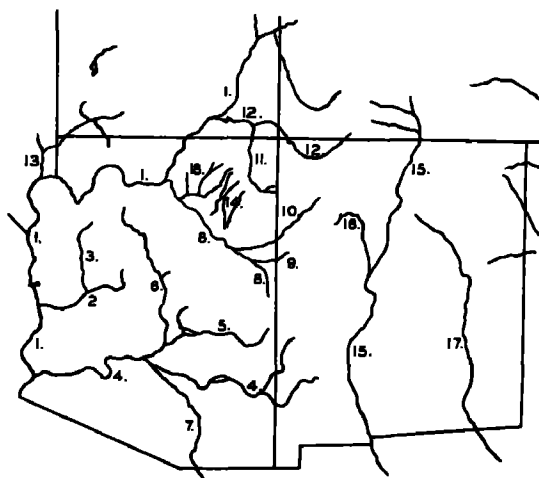


Fig. 4. Major rivers in the portion of the Southwest dealt with here. 1. The Colorado River. 2. Bill Williams River. 3. Big Sandy River. 4. Gila River. 5. Salt River. 6. Verde River. 7. Santa Cruz River. 8. Little Colorado River. 9. Zuni River. 10. Rio Puerco of the West. 11. Chinlee Wash. 12. San Juan River. 13. Virgin River. 14. Hopi Washes. 15. Rio Grande. 16. Rio Puerco of the East. 17. Pecos River. 18. Moenkopi Wash.

the larger mammals, are generally the most wide ranging. The wild turkey, king of American game birds, was widely distributed wherever sufficient brushy cover could be found.

In prehistoric times the bird and animal life must have been very abundant indeed. Records of early trappers, hunters, and military expeditions into the Southwest reported an almost unbelievable abundance

of game birds and animals from various sections. The nature of the country probably tended to center animal populations in certain localities, as it does today, and left others relatively sparse. Since wild animals prefer rather dense cover, and agriculture cannot, as a rule, be best practiced there, it is quite likely that with the rise of agriculture the human and animal populations were increasingly separated.

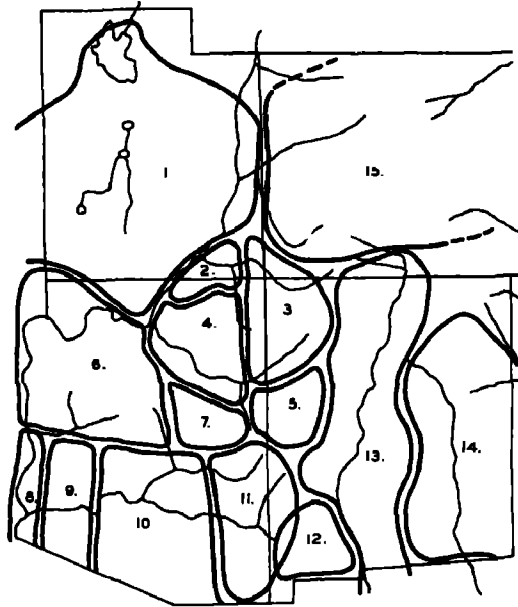


FIG. 5. Rough outline of geographic areas of the Southwest. 1. Northern peripheral area. 2. Western San Juan. 3. Eastern San Juan. 4. Hopi or Little Colorado area. 5. Zuñi area. 6. Kingman area. 7. Mountain area. 8. Colorado River area. 9. Lower Gila. 10. Middle Gila. 11. Upper Gila. 12. Mimbres. 13. Rio Grande. 14. Eastern peripheral area. 15. Western Colorado area.

Rainfall in no part of the Southwest is sufficiently abundant to establish many permanently running streams, and as a result those which do exist are advanced to a position of magnified importance. This situation is true of every country where rainfall is at a minimum, and strikingly enough many of the earliest primitive civilizations have had their rise in areas not greatly different, climatically, from that of the Southwest.

Because the waters of a dry country are concentrated in the river valleys and systems, the population of the area, dependent primarily

upon water, is also found more or less centered here. Dr. Kidder, in his *Introduction to Southwestern Archaeology* in 1924, clearly recognizing this fact, roughly bounded and appropriately named these areas. In this manner the various culture divisions may still be bounded by drainage provinces. Subsequent investigation, however, has indicated that these divisions, based only on drainages, are not strictly correct, and that they must often be broken up or subdivided into smaller sections on the basis of minute and vital physiographic or ecological variations.

The accompanying map (Fig. 5.) is an attempt to present the larger of these physiographic divisions for the purpose of fixing in mind the geographical areas. In referring to a general locality and not a specific section it is still most useful to speak of the western San Juan or the Upper Gila.

However, it must be borne in mind that primitive people did not always hold strictly to any rule, either man made or of nature; in many instances in various places they spilled over their natural boundaries and intermingled. The more detailed a study is made of any problem the more complex it is quite likely to become, as the following chapters will demonstrate is true in Southwestern archaeology.

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Chapter II

HISTORY OF SOUTHWESTERN ARCHAEOLOGY

Before the problems of Southwestern archaeology can be thoroughly grasped, it is necessary to review history so that past conditions and methods may be more intelligently compared with present ones. For years the remains of prehistoric Southwestern civilizations have been recognized, and from the very beginning of recorded history much interested conjecture has been raised concerning the people who left them. To facilitate discussion, the history has been divided into eight more or less natural sections, each of which may be defined by certain easily recognizable characteristics.

The history of the Southwest is divisible, in its early part, into two major geographically separate groups: the exploration and colonization which went up the Rio Grande Valley, and that which centered in northern Sonora and southern Arizona. This latter followed the Santa Cruz River, and eventually worked its way into the Gila drainage. In like manner two great temporal divisions can be established, the first of which may be termed Spanish invasion, and the second English.

Spanish Exploration and Colonization — A.D. 1540-1692

The history of Arizona actually begins in 1539 when Fray Marcos de Niza and a negro, Estavanico, "Black Stephen," entered Arizona from Mexico in search of the famed Cibola. Though the negro was killed, Fray Marcos returned with such glowing tales of wealth to be gained in this new country that Coronado sent Diaz and Zaldivar back, in the same year, to verify the story. This expedition probably never got farther than the Gila River but returned to report the finding of the seven cities and to substantiate the claims made for them.

In 1540 Coronado had succeeded in actually organizing his expedition and entered the Southwest with three hundred Spaniards and about eight hundred Indians. During his travels in search of the mythical

Cibola, city of gold, he and his men noted and often discussed the ruins which they encountered on the way, particularly those in the vicinity of Zúñi, where they stopped for some time.

It was while at Zúñi that Coronado learned of the Province of Tusa-yan, some twenty-five leagues to the northwest, where another group of Indians (the Hopis) were living. Coronado dispatched Don Pedro de Tovar to investigate this report. Arriving at the Hopi towns the small band saw little of interest, certainly nothing comparable to the seven



A general view of the desert country of northeastern Arizona. The broad sweeps of such wide-open valleys are characteristic, as are the flat-topped mesas and the deep box canyons.

cities. Don Lopez de Cardinas, hearing rumors of a great canyon to the west, pushed on and was undoubtedly the first white man to see the Grand Canyon. This was probably about the extent of the travels of the expedition in northern Arizona, although they went much farther northeast, almost certainly crossing the Canadian River. Coronado arrived at Zúñi about June 6 to 10, 1540, and returned to Mexico and disbanded by June, 1542.

Because of the difficulties attendant upon any expedition into the

Southwest few explorations were made in the next several years. In 1581 Friar Fay Augustin Rodriguez and two others, with eight or nine soldiers, went up the Rio Grande to the Pueblo of Puaray, where they were left with the Indians and the soldiers returned to Mexico. Late in 1582 Don Antonio de Espejo and fourteen soldiers left San Bartolome, and visited Puaray in 1583 but, finding all the friars dead, pushed on with a series of explorations. With one friar and fourteen soldiers this intrepid Spaniard accomplished as much exploration in Arizona and New Mexico as Coronado with his great band. He went on into northwestern Arizona and there located several valuable mines before he returned to Mexico in the fall of 1583.

One of the most important expeditions of this period was undertaken by Don Juan de Oñate, who with 400 men (130 of whom had families), 83 wagons, and several thousand cattle reached the Rio Grande River in April, 1598, and following it north attempted to settle near what is now Santa Fe. One of the outstanding occurrences of the expedition was a battle fought with the Pueblo of Acoma, which on January 21, 1599, was destroyed by the Spanish. Explorations were also undertaken by Oñate reaching as far as the mouth of the Colorado River.

In 1610 a history of New Mexico, partly in prose and partly in verse, was published by Captain Gaspar de Villagra, the material of which was gathered on the Oñate expedition. Although this undoubtedly represents the first archaeological treatise on the Southwest, it is actually largely a poetic narrative of the various conquests and battles of the Spaniards, in which the battle at Acoma is recorded in great detail. Probably more than anything else this account crystallized, or summarized, the ideas of the Spaniards regarding the origin of the Mexican cultures, for the many ruins in the Southwest were regarded as early Mexican.

From about 1600 on colonization and missionizing progressed rapidly, being broken only temporarily by the Pueblo Revolt in 1680. By 1642 there was a mild pueblo revolt in which the governor of the territory was killed, but it remained for a San Juan Indian, named Popé, to organize the Indians effectively for the later general uprising. Finally, on August 21, the entire Spanish population abandoned Santa Fe and moved south to El Paso.

With this evacuation of the northern portion of the Rio Grande the first period of occupation of the Southwest is brought to a close. Fray Marcos, having indicated the way, was soon followed by a long series of

explorers, missionaries, and treasure seekers, all of whom observed but made very little attempt at investigation of the many prehistoric sites. Toward the end of the period actual settlement took place in northern New Mexico, but it was not truly effective there and could have exerted little or no influence on the Indians of Arizona.

Spanish Settlement — 1692-1821

The Rio Grande in New Mexico. The period from 1692 to 1821 is marked by no great contributions to either archaeology or ethnology. With the exception of the work of such men as Father Garces, Escalante, and Anza, the period may be characterized as one of constant strife between the church and military or governing authorities. This unhappy condition was largely a result of the great distance of the seat of government, as several months were required for reports to reach Spain and authorizations to return.

On August 12, 1692, Don Diego de Vargas left El Paso with sixty soldiers, a hundred Indians, and three friars to reconquer the Indians of the entire area of the territory of New Mexico. This he accomplished in short order by one of the most astounding military feats of history, for not a shot was fired in the campaign. By enlisting one Pueblo against another, he continued to make each in turn capitulate.

Although the Hopi Indians in Arizona were not much affected by the Spaniards during this period, they were occasionally subjected to European diseases. In 1775 there were believed to be 7494 of these Indians, but by 1780 they were estimated as only 798. This great reduction resulted from three years of drought, between 1777 and 1780, accompanied by disease.

From about 1800 on, the Spanish were very much afraid of both rumored and actual advances which were being made by the English and French. At about this same time the Navahos appear to have moved west to the vicinity of the Hopi towns and to have begun serious depredations on this sedentary and peaceful people. As a result the Hopis appealed to the Spaniards for aid, but the Spanish were too occupied by threats of the English and French, and too easily hoodwinked by a few insincere and unauthorized Hopi emissaries, to be of much assistance to them.

In 1815 Auguste P. Choteau and Julius de Mun with twenty-four trappers and hunters actually entered New Mexico, camping north of Santa Fe. These first aliens were arrested and their goods confiscated,

although by 1821 or 1822 legitimate trade had been established between the Americans and the Spaniards, now under Mexican rule, in Santa Fe.

Southern Arizona. With the exception of the very early explorations of Niza and Coronado little is known regarding southern Arizona until relatively late. No settlement was made in this entire area, with the exception of the Santa Cruz Valley, until about 1845, when an American military exploration was undertaken. Even this early American exploration was rather sketchy, but with the gold rush of 1849 the area was definitely opened and settled.

The first reference to southern Arizona is found in 1630 when the Gila was named as an area in the territory comprising New Mexico, from which source the Gila River eventually derived its name. The first definite explorers in Arizona were the Jesuits, the most notable of whom was Father Euseibo Francisco Kino (1680-1710), who alone, and with Indian guides, traveled over much of this state. His purpose was to establish a chain of missions connecting Mexico and California. He kept records of his activities and has given us some excellent ethnographical observations.

In 1694 Kino penetrated alone to the Gila and said mass in Casa Grande, which was then standing with high walls. Again, in 1697, he made a trip to the Casa Grande region in search of ruins which had been described to him by the Indians. These ruins he pictured and in turn described in his copious diaries. After 1711, for more than twenty years, no Spaniard is known to have crossed from Mexico into Arizona. The Mission of San Xavier del Bac, established on the Santa Cruz River near the present city of Tucson, probably in 1732, represents the first substantial settlement by Spaniards in this section.

As a result of serious rivalry between the Jesuits and Franciscans the former were removed from the Southwest in 1767, and the entire territory, with all the church properties, was given over to the care of the Franciscans. In 1768 the Franciscan Padre, Francisco Garces, took over the mission of San Xavier, in subsequent years traveling widely over the state, much after the manner of Kino. It is an interesting fact that on July 4, 1776, when the Declaration of Independence was being signed, he was in the Hopi towns, where he was very poorly received, being given no food or shelter.

By 1775 the Apaches had begun to cause trouble in southern Arizona, and from then on they were never congenial to the Spanish or to the more peaceful Indians of the desert country. Notwithstanding their



Portion of Betatakin Pueblo, a Pueblo III cliff dwelling in Betatakin Canyon, a branch canyon of the Tsegi in north central Arizona.

raids, the period from 1790 to 1820 was one of prosperity for this region, ending only with the cessation of Spanish rule. Records for this period are in marked contrast to those for the same time from the Rio Grande, where the Indians seem to have constantly suffered at the hands of the Spanish. This may possibly be accounted for by the fact that military forces were largely lacking in southern Arizona.

Mexican Period — 1821-1845

With the change of rule from Spanish to Mexican, the Southwest was thrown into a state where no work in archaeology or ethnology could be accomplished, and a period of exploration was again begun, this time by Americans. One of the earliest American groups to enter the southern portion of the Southwest was James O. Pattie and his party, who trapped on the Upper Gila in the autumn of 1825 and again from 1826 to 1836. Finally trouble developed with the Apaches, and the trappers left this section until it came under American rule. The final serious settlement of southern Arizona occurred in the eighties, when silver and copper had been discovered and was being mined.

During this entire period only a few hunters, traders, and trappers entered the Southwest, and these were mostly confined to the northern portion of New Mexico, where Indian difficulties were not so serious. However, once they gained root, they gradually spread south and west to establish their posts or trapping quarters.

Military Reconnaissance — 1845-1880

The first exploration of any consequence consisted of a military reconnaissance headed by W. H. Emory, which traveled from Fort Low, Missouri, to San Diego, California. The expedition was reported in detail in Washington in 1848, the routes traveled, the Indians met on the way, their attitude to the party, and some landmarks which consisted of ruins being noted. This expedition seems to have aroused considerable interest in the Southwest. In 1849 J. H. Simpson reported on and sketched the ruins in Canyon de Chelly, thus further adding to the interest in the pre-history of this region.

This marked the beginning of several important military expeditions. In 1851 Lieutenant Sitgreaves followed down the Zúñi River to the Little Colorado and down this river to about Grand Falls, noting ruins in that vicinity and eventually crossing to California. The next expedi-

tion was one by J. R. Bartlett, which is reported in the form of a personal narrative, dealing mostly with Texas but touching slightly on New Mexico and southern Arizona. In 1853 Whipple, making a railroad survey for the government, passed through New Mexico and Arizona, visiting Turkey Tanks near Flagstaff. He was followed in 1854 by Aubrey, who crossed approximately the same region, and in 1857 by E. F. Beale, who made a wagon road from the Arkansas River to California. In 1858 Ives traveled overland from Needles to Fort Defiance, and in 1858 and 1859 Beale again went from Albuquerque to the Colorado River and back. Thus military expeditions were crisscrossing the Southwest in every direction for several years.

By 1863 trouble with the Navahos had become so acute that Kit Carson was commissioned to subjugate them. This he did most effectively in that year by rounding them up in Canyon de Chelly and removing them to Bosque Redondo in New Mexico, where they were held by the government as prisoners for several years.

In 1869 and in 1871 Powell made trips through the Grand Canyon from the Green River in Wyoming; he not only reported the geology, topography, and country through which he traveled but also showed a great interest in archaeology and ethnology. This expedition, which became widely known, made a general appeal to the public. It was the interest which Powell developed at this time that carried him into the fields of archaeology and ethnology in the years immediately following.

From all these expeditions into a newly acquired area the general public, for the first time, became truly interested in the Southwest. A country which was so much like portions of native Spain as to impress the Mexicans not at all was so radically different from American ideas of what topography and climate should be that the keen interest in the newly acquired area was not surprising. Not only the type of country, but the large standing ruins as well, so impressed the Americans that it was perfectly natural that the first investigations were concerned with types of houses and with the effect of the country, or nature, upon man. By 1875 cattlemen, sheepmen, and big-game hunters had drifted into much of the Southwest. These individuals settled and thus made scientific work more feasible, or returned to other sections to spread tales which further fired popular interest. As a result by about 1880 sincere archaeological and ethnological work was undertaken for the first time.

Archaeological Survey — 1880-1910

The period from about 1880 to 1910 was the most important in Southwestern archaeological history, for it was then that the science was getting a foothold and principles were being developed which would guide it through later stages. This was the period when general surveys of large areas were being undertaken. Two questions were being seriously considered: first, the effect of the peculiar environment on human beings; and second, a natural outgrowth of the first, the origin and development of the Pueblo groups.

In 1876 and 1877 A. E. Barber, becoming interested in the Southwest, wrote two semi-popular articles in which he pictured and described pottery and other artifacts from the Colorado, Utah, Arizona, and New Mexico section. These apparently marked the beginning of an extensive series of such reports, which immediately followed.

A long list of important names characterizes this period, Powell, Holmes, Cushing, Washington Matthews, Stevenson, Victor Mindeff, Bancroft, Bandelier, the Wetherills, Nordenskiöld, Fewkes, and Cosmos Mindeff being perhaps the most outstanding. Powell was director of the Bureau of Ethnology at this time, and in 1879 and 1880 the first annual report appeared. In it he reported on the beginning of his linguistic studies, to be followed in 1885 and 1886 by his important *Linguistic Families of America North of Mexico*. At the same time William H. Holmes, a member of the United States Geological Survey, and from 1882 to 1893 curator of pottery at the United States National Museum, began publishing reports on his ceramic and textile studies.

In 1879 Cushing took up his life at Zuñi and, in connection with his work in mythology there, later made a survey of the ruins to check the accuracy of these tales. Such an investigation naturally led him to a discussion of Pueblo pottery and Zuñi culture growth. In 1879 and 1880 Stevenson visited several of the Pueblos of Arizona and New Mexico and, in making collections of artifacts, particularly from Walpi and Zuñi, evolved a simple pottery classification.

In 1881 Victor Mindeff, who was later assisted by Cosmos Mindeff, began his studies of modern and ruined pueblos, with an emphasis primarily on geography and secondarily on clans. This interest in house types and traditions was passed on to Cosmos Mindeff. His conclusions, published in 1886-1887, may be summed up in four points, the third of which, in the light of our present knowledge, is probably the most interesting.

1. He pointed out the contrasts between Tusayan, (Hopi), and Cibola (Zuñi).

2. He indicated the importance of the physical conditions of the country in determining the nature of the sites, and also that the press of unfriendly neighbors resulted in a change of architectural type.

3. He indicated an architectural evolution which was largely a result of the materials at hand and was traceable from circular conical structures to Pueblos.



A view into Betatakin cave from the top of the cliff above the site. This is an excellent example of the natural arched caves of northern Arizona.

4. He pointed out that the defensive motive reached a peak and declined in recent years.

The publications of both Bancroft in 1889 and Bandelier in 1890 continued this theme. Bancroft, in his history, made several observations which are of considerable interest and value even today. For the first time he definitely labeled the Montezuma myth as of Spanish origin, and he maintained that contacts with Mexico or Central America antedated

traditional annals. He pointed out the necessity of studying archaeology and ethnology together and indicated the value of such work in the Southwest where the people were probably the least changed from their aboriginal state of any in the United States at that time.

Bandelier made several points of sufficient present interest that they might be briefly listed somewhat as follows. He was the first to point out that the small house developed into the pueblo. He saw a similarity in structures on mounds in the Gila Valley and those of Mexico and Central America and compared them. Areal variations were recognized, but he did not stress time variations. From traditions he postulated a population shift from north to south, but he also suggested other local conflicting movements. These are essentially the same problems with which most Southwestern archaeologists were concerned at the time.

So far as is known at present, Richard Wetherill, a Southwestern cattle man, was the first to make use of natural stratigraphy as applied to archaeological problems in the Southwest. From his work in the western San Juan he established the Basket Maker Culture stage as distinct from, and earlier than, that of the later Pueblo people. He published a report of this observation in 1894, and the same facts were written up by Prudden in 1897 and again by Pepper in 1902.

J. Walter Fewkes began his work in northern Arizona about 1893, taking as his main problem the Hopi Indians, and tracing their traditions back through archaeological material. In subsequent years he traveled over much of northeastern and central Arizona in a covered wagon, visiting and describing almost all the standing ruins. Architecture and pottery particularly interested him, and he expended a good deal of effort in trying to decipher symbolic pictographs and pottery decorations. There is little doubt that Fewkes wielded a dominant influence in Southwestern archaeology at least as late as 1910.

Two reports of Mindelch which were published during this period must be mentioned. Their architectural approach represents the general attitude toward archaeological problems of the time, and they are such complete and excellent studies that they are still of value and commonly used by present workers.

Many of these first workers or investigators branched from other sciences to archaeology, or were essentially untrained in scientific work, and as a result not a few of the earlier expeditions were little more than collecting trips. However, some of the most entertaining writings come from popular works; one of them explains the kivas in the Mesa Verde

region as reservoirs, and proposes an ingenious method of piping and viaducts to run water into them around and over the overhanging tops of the caves in which they lie.

The only work of moment in the Gila section of southern Arizona and New Mexico was that of the Hyde expedition, which was reported on by Hough in 1907. It is regrettable that the true importance of this work was not recognized at this early date. As has been suggested, it was from about 1880 to 1910 that the basic principles of archaeology were being established, so that masonry and house-type classifications, and interpretations of ceramic designs, have naturally played an important part in later studies. Starting with no knowledge, even the better investigators overlooked much, but with the years information piled up, until at last certain periods were recognized. As has been seen, before 1900 two temporal horizons were admitted, the Basket Makers and the Pueblo.

Throughout all this period large collections of material objects were accumulated, some of which were sold abroad, stored in museums, where many of them still remain, or scattered among individuals. With the depth of present perspective it would certainly be of value to re-examine these old collections.

General Archaeology — 1910-1920

The next period, from 1910 to 1920, saw the introduction of many men into the field who are still seriously at work there. At the beginning of this period the problems of archaeology were considered to be one, and chronology had progressed to the point where only two sequential divisions were recognized in northern Arizona. Regional differentiation in small areas had not been recognized, and the northern and southern roots had not been separated.

Two names, that of Cummings in Arizona, and Hewett in New Mexico stand out most conspicuously. In 1906 Cummings began his archaeological work in Utah, and two years later he made his first trip into Arizona. In 1915 he left the University of Utah and joined the staff of the University of Arizona, where he has been at work ever since. Although he has done comparatively little writing, he has undoubtedly been the leading archaeological worker in Arizona, having trained many of the men who are now at work in the Southwest. The house-type classification which he evolved and put into use will be discussed at some length later.

At this point it is unnecessary to treat the important names in the

history of Southwestern archaeology in detail, for they will be referred to often in the following pages of this book. However, some mention of the most important influences, and the men responsible for them, will be made.

In 1912 N. C. Nelson, working in New Mexico, for the first time made a strict use of statistical methods developed in Europe, and reported on this method in 1916. At about the same time, or a little later, Kidder and Guernsey were making statistical studies in the San Juan, and Morris was applying the same general attack at Aztec. Once statistical methods of sherd counts and stratigraphic work were introduced, they became not only practically a necessity to any archaeologist working in this field, but actually almost a fad. Probably this method of attack reached its culmination in the work of Kroeber in the Zuñi region, in the establishment of a chronology with little or no excavation.

During this time Kidder, Guernsey, and others began their serious work, laying the foundations of their later classifications based on areal and cultural divisions. The period was characterized by the accumulation of data. Although northern Arizona, and particularly the San Juan, was most intensively studied this time can hardly be called one of areal specialization, for individuals and institutions excavated or surveyed widely. The less cautious methods of the preceding period, and the attitude that the supply of ruins was inexhaustible, were replaced with conservative principles. Much loot was removed from the earth and carried away, through the activities both of the "pot hunter," who worked for individual gain, and of large institutions which required their field workers to bring back display materials.

Areal Specialization — 1920-1930

The period of areal specialization, from about 1920 to 1930, marked some of the most radical changes in the work in this area. It was during this time that Kidder's *Introduction to Southwestern Archaeology* appeared, the Pecos classification was fostered, and Dr. Douglass contributed his first series of actual prehistoric dates.

The work of Cummings, Kidder, Guernsey, Morris, Judd, and Hewett was continued, but an attitude of specialization by areas became paramount to most of these workers. Out of the intensive stratigraphical studies of the preceding period, the building of chronology assumed the most importance. Although the idea of areal specialization was not new to Southwestern workers, Kidder's book tended further to accentuate its

importance, and the conception of the value of widespread surveys, accompanied by detailed concentrated investigations of restricted areas, naturally ensued.

By 1927 the rapid accumulation of data, which was indicating a definite chronology, led to a general conference at Pecos Pueblo, where Kidder was then at work. The discussions which followed, led mostly



Grand Falls in the Little Colorado River northeast of Flagstaff. Although in prehistoric times the river in this section was a permanent stream it now flows only in flood periods.

by Kidder, Roberts, and Morris, developed the Pecos Classification. This was designed as a division of cultures into stages of cultural development, and was felt at that time to be rather generally applicable, though developed from data derived primarily from northern Arizona. Pottery, which had long been recognized as an excellent measure of culture change, rapidly assumed a position of increasing importance as applied to the Pecos Classification.

At this time several new purely Southwestern institutions came into being, to give support to the work long under way by the University of Arizona and the State Museum, each of which took over the examination of smaller, more or less prescribed, areas. From this work chronology and cultural divisions received a considerable boost, and the way was paved for the attitudes of the next period.

Intensive Analysis—1930 On

The work from about 1930 on may best be characterized as a period of intensive analysis. Detailed, in many cases almost microscopic, examinations are tending to replace the coarser methods of the preceding periods. Ceramics have come into their own, to be subjected to almost every conceivable treatment, with the result that types have been established and subdivided until the intricacies of classification approach those of the animal kingdom.

Tree-ring dating has progressed at an equal if not faster rate. At the present time a ring chronology has been carried back to A.D. 11, covering all the major culture stages in northern Arizona. With much exactness and considerable labor, pottery types and other prehistoric material have been dated by correlation with tree-ring dates, and, from these, attempts have been made to correlate the various culture stages of the Pecos Classification with our own calendar. Dating has been a field of peculiarly exciting interest, and at the present time a feverish activity prevails.

Neither the field of broad surveys nor areal specialization have been neglected in the interest of ceramic studies. In an effort to make all this additional information intelligible, more complex systems of classifications are being introduced. With the clearer understanding of what constitutes basic cultures and divisions, it has been possible to point out culture centers and influence.

Most recently another cycle of endeavor appears to be forming in which the archaeologist is once more attempting to bring together all the data from the various fields of specialization into a unified whole. Not until this jigsaw puzzle has been more or less completed may we hope for anything approaching a true picture of Southwestern archaeology. It is in an attempt to make a beginning in this direction that the rest of this volume is written.

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Chapter III

DEFINITIONS, AIMS, AND METHODS

Definitions

Unfortunately, in beginning any science, it is necessary to understand thoroughly the various terms which are employed before actual work may be undertaken. For many of these terms usage has established meanings often quite different from the specific uses to which the scientist puts them. It is necessary to define here only the few terms that are so common that further progress without them is impossible, the rest being explained as they occur.

One of the most commonly used, and also misused, terms in any discussion of archaeology is culture, but before culture can be conveniently defined we must define culture trait. Dr. Wissler has defined a *culture trait* as the unit in tribal culture. This is a usable definition, but is hardly specific enough to explain definitely what a trait is. More simply, a *culture trait* might be explained as the individual things used by man, but this would not quite cover all the traits of a group. Actually there are two types of traits: material, and non-material. Obviously the material traits are those things, or objects, used by man, and in our own culture would include all the articles pictured in a mail-order catalogue. The non-material traits, on the other hand, are mental attitudes, or customs, which have no material existence. Such customs of any group are the beliefs, games, religious ideas, and all similar concepts. These are called folkways, morals, and laws.

Any given *culture* may now be described as being made up of all the material and non-material traits of the people. Obviously, any group of people, to be considered of a distinct culture, must show a total aggregate of traits sufficiently distinct from that of any other people to set them definitely apart. Thus in the Southwest two contemporaneous but different cultures may be recognized almost immediately, that of the plateau, which has generally been called the Pueblo Culture, and that of the desert area, which is known as the Hohokam Culture.

Diffusion is a term which is much more difficult to explain but may be briefly characterized as the spreading out, from one center, of a

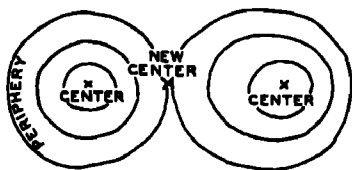


FIG. 6. Highly diagrammatic example of diffusion from two centers of origin, showing periphery and a new center of origin.

culture trait, traits, or perhaps even an entire culture. It is quite logical to assume that most of our inventions have taken place but once, that is to say, that one man, at one place and at one time, invented and built the first of each of our modern articles. It is also equally logical to assume that once an invention has been made those people coming in contact with it will, provided that it is of value to them,

attempt to copy it and perhaps even improve upon it. This leads to a gradual spreading out from person to person, district to district, country to country, and even continent to continent, of many culture traits, until they become widespread. This process of adoption and spreading is what is known as *diffusion*.

Not always is a given trait quickly and easily transferred from one group to another, for if it is of such a nature as not to be of advantage to the group to which it is offered they will certainly reject it. Rejection of a trait will also take place where its acceptance would cause a considerable disruption of the cultural *balance* of the group. Such is generally true with religious teachings, a fact which is quite often overlooked by missionaries in their zeal to secure converts. On the other hand, some traits seem to have been readily accepted very widely. An example is the use of iron, which replaces stone implements almost universally to advantage, or more strangely tobacco, which has been quickly accepted by many groups throughout the world. This process of acceptance of some traits and rejection of others has led to a very uneven distribution by diffusion, when large areas are considered.

The principle of the flying machine was established in Ohio by the Wright brothers, but as soon as it was seen to have value other individuals adopted it, so that it has now spread throughout the world. The same has been true of primitive traits in the Southwest. The art of pottery making, once established, spread rapidly from person to person, and even group to group, until it covered almost every part of this area.

The central point of distribution of an area of diffusion would tend, all other factors being equal, to be the point at which the discovery was

first made, and because this place would be where it had been known for the longest time, new additions in technique or variations in production would be most likely to originate there. This in turn would diffuse, or spread out, and so wave after wave would be sent out from the center of development. The first discovery would be likely to travel the farthest, so that on the edge of the area over which diffusion had taken place would be found the first or most primitive type. The edge of this area of diffusion is called the *periphery*, and any trait found there is said to be *peripheral* to the area of that trait. Thus, if a ring of very primitive pottery types is found surrounding a region, as progress is made toward the center of that area we may rightly expect to find an increasingly involved technique of pottery making.

If diffusion were always ideally regular and uniform the problems of the archaeologist would be greatly simplified. Unfortunately, however, this is generally not true. It has been suggested above that traits, by acceptance and rejection, often travel irregularly over an area, and to this may now be added two further observations. If modifications may be made at the point of origin of a trait, they may also equally well be added as it travels outward by diffusion. As a result the trait may be considerably altered in appearance from its original form by the time it reaches its periphery. Also two somewhat comparable traits, spreading from two centers of origin, may give rise to quite a new form when their two peripheries meet. When complete cultures, instead of simple traits, are concerned, much more complex problems arise, of course, and the life of an archaeologist is anything but an easy one, for a new culture may thus suddenly be created by the combination of the two.

Stratigraphy has been the very backbone upon which archaeology everywhere has been built. Simply stated it is merely the study of the contents of strata. A layer cake is an excellent example of stratigraphy. Here each layer represents a stratum, and to the most uninitiated it is obvious that the lowest layer must have been laid down first to support those resting upon it. Thus the lowest layer is oldest, the next above younger, and so on to the top, where the most recently laid down layer, or stratum, is found. A study of the contents of these layers will then give some idea of the relative ages of the strata, and this study is stratigraphy.

Almost all people of every age have preserved definite dump grounds where the material that was discarded from their homes was deposited. These accumulations are known under the various names of "trash

piles," "dump heaps," "kitchen middens," and "refuse piles." It is to this place that the archaeologist usually turns for his most definite example of stratigraphy. A kitchen midden is located, and a vertical shaft or trench is sunk in it. Each layer or stratum is kept isolated, and all the culture trait material, such as sandals, baskets, and pottery, is collected from its respective layer and studied. The most recent or latest material will come from the top layers; the earliest or most ancient, from the bottom. The archaeologist then need only arrange these objects in the order in which they were uncovered from the bottom up and he has a sequential evolution of the culture of the people who made them. Although the objects contained in a trash mound are hardly those of a mail-order catalogue, most trash mounds are the archaeologist's best substitute for such a document.



FIG. 7. Diagrammatic section of a double trash mound. The sequence in time of deposition is from A to G. If a second trash mound, with several layers, is found, the lowest of which contain material like that of E, F, and G, these layers are comparable in time, and any additional strata above these will lengthen the chronology.

The correlation of strata containing identical objects from two middens will give a more or less definite time correlation between two sites, for cultural evolution or change is continuous, and any considerable time span would show differences in culture. Additional material in the form of more strata will then extend the chronology, and in this manner archaeological sequences may be built up. However, without recourse to actual dates, any chronology of events such as that produced by stratigraphy will result in only relative and not absolute time.

Archaeological Aims and Methods

With this brief identification of a few of the most commonly used archaeological terms it would probably be well now to examine the aims of the archaeologist, and the manner in which he goes about achieving these aims, before turning to more detailed discussions of other methods and problems. It is continually necessary in any work to stop and remind oneself of the ultimate aims of the undertaking; otherwise the temptation to digress or the confusion of pressing problems will

often obscure the ultimate aims. It is an example of the trees obscuring the forest, and in an effort to focus the forest more clearly these aims should now be definitely delineated.

As a direct means of opening this problem, and without any specific attempt at definition of either history or prehistory, it may probably most safely be assumed that archaeologists are attempting to make history of prehistory. If this is so, history, and the aims and methods of history, should be of considerable value in further defining the problem.

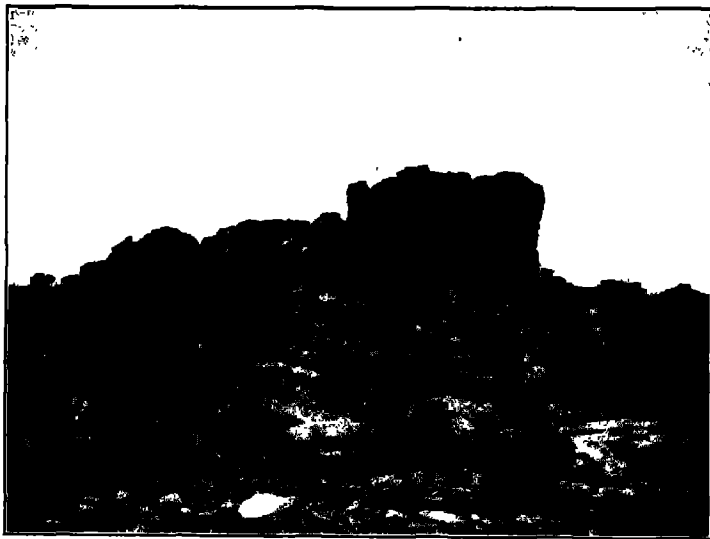
Any attempt at history must be concerned with three types of phenomena: events, places, and time. History, however, is not simply the notation of these three kinds of things, but is actually the study of their relationships, both to themselves and to each other, plus an explanation or interpretation of these relationships.

The difficulties which confront the archaeologist in determining and interpreting these three kinds of data and their relationships are, of course, much greater than those of the historian. Events, which might be defined as any occurrences or happenings, are indicated only secondarily to the archaeologist, generally by the presence of material traits which have been preserved in the ground. For instance, the presence of one piece of pottery indicates that the trait of pottery making was known, and that this particular object was made by one person at one time and place. Thus traits, as represented by artifacts, once they are in hand, are indisputable. It is in the interpretation of how these traits came to be that real difficulty is encountered. Places, or the areal element, are generally quite easily determined, for any object must have a location in space. Indefiniteness in this matter usually arises from incomplete data in studies concerning trait distribution. Of the three, time is obviously the most difficult to determine with some degree of accuracy. Fortunately, in the Southwest, tree-ring dating has been of the greatest value in this respect, though few persons truly appreciate the difficulties often encountered in the correlation of tree-ring dates and culture. Elsewhere relative chronology is largely the source of dating prehistory.

The determination of both the temporal and areal elements rely upon specialized techniques, which will be briefly discussed later. Once these two factors, and events, are determined, the real task of the archaeologist becomes apparent. This is the interpretation of their relationships.

Though there is a very close parallel between the aims of the archaeologist and those of the historian, a much closer similarity in methods is

to be found with those of the detective. Both the detective and the archaeologist are concerned with the reconstruction of past events, and both deal with far from complete data. Each must collect clues, in the form of material objects, and from these deduce the non-material traits which went to produce the situation under consideration. The modern archaeologist, like the modern detective, cannot rely upon guesses, unless they are freely admitted and so labeled. He must work with all the skill and every aid that is at hand, and he must have available or be personally



Fewkes Ruin J near the Little Colorado River is one of a large number of small sites of Pueblo III Culture stage found northeast of Flagstaff. They are all of coursed sandstone or limestone blocks.

acquainted with whatever help any other science is able to contribute to the solution of his problems. Quite often it is the most fragile clue which will contribute most to the solution of the situation.

Thus the archaeologist, historian, and detective are all confronted with the important problem of the interpretation of the relationships of events in their proper time and space context. Turning again to history, the historian is found to be interested in the developmental sequence of events, one of which arises from another, giving a cultural continuity, or what might be termed a "genetic" relationship of events. Such a rela-

tionship may be demonstrated through the building of chronologies, which are simply the notation of a series of events in their proper time sequence from one area. Thus the business of chronology building is actually the basis of both history and archaeology, as it has been defined.

The historian is further interested in three sorts of relationships: a local series of genetically, or developmentally, related events; the influence which this series had on other regions; and the influence outside areas had on its development. These are the same problems which confront the archaeologist.

We may now define *pure archaeology*, as used here, as the interpretation of the interrelationships of three kinds of phenomena: events, time, and space. A somewhat similar sort of study, which has enjoyed considerable popularity at various times and places, might be termed "archaeography," and may be characterized as the study of only two elements, events and area. The third type of study, for lack of a better term, has been called "chronology," and it too concerns itself with only two characters, events and time. Even a fourth type of work has occasionally laid claim to the title of archaeology, principally from the fact that it deals with data removed from the ground. This sort of study is simply an interpretation or comment upon artifacts or events, often with little or no regard to the other factors mentioned above. It generally takes the form of artistic evaluation, and so has only a minor part to play in such a study as the one presented in this book.

As has been suggested, the problem which causes the archaeologist the most difficulty is the relationships of the three phenomena, time, space, and events. These relationships may be broadly divided into two types: the first, as suggested just above, is a developmental or "genetic" series; the second, a non-genetic series, on what might be termed a replacement or competition series.

These two basic series may be characterized by four possible situations which, most unfortunately, often tend to overlap somewhat. These are: First, lineal development, or chronological sequences, obviously a pure genetic series. See Fig. 8. Second, fusional series, wherein varying degrees of fusion or acculturation occur. Two subtypes of this situation may easily be recognized. Third, divergence, or splitting of a cultural sequence, which is usually a result of regional differentiation. And fourth, replacement of one series by another, obviously a non-genetic series.

The question of what indicates a genetic series naturally arises. It has

generally been accepted that whenever a close similarity of the total culture elements of two groups is noted these two groups are genetically related. This statement is based on the assumption that a fortuitous identity of one trait, or even of two or three traits, might be imagined, but that mathematically the identity of an entire series of traits, or a

total complex, becomes so highly improbable that it may be disregarded.

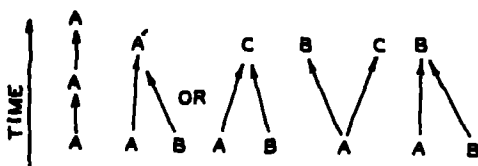


FIG. 8. Illustration of possible chronological variations. Reading from left to right they are: lineal, or genetic development; two variants of fusional series; divergence; and replacement series.

Following this same principle several similar "laws" may be suggested, most of which have been successfully applied and tested in the Southwest. First, that identical, or almost identical, cultures indicate

identical, or almost identical time (remember that this is based on a detailed similarity, or near identity, of total trait complexes, not individual traits). Second, close cultural similarities indicate close time similarities. Third, nearly identical cultures tend to group into geographical areas (this is the basis of the phase in the Gladwin classification). All this might be summarized in the statement that very close cultural similarities indicate very close genetic, time, and areal relations, while less close similarities indicate less close or in extreme cases no relations. This principle is the basis upon which roots, stems, branches, phases, and components are built.

The determination of the degree of identity or relationship of culture is often a difficult problem in itself. Various systems of comparison have been developed, such as a consideration of what are termed "diagnostic traits" or complexes of traits. However, the most perfect comparison is obviously one which is based on as many different traits as possible, and in any consideration of trait identities it is by far most worthwhile to compare every single trait which may be uncovered. Once cultures have been established it is possible to point out which of these traits are really of importance in designating one culture as distinct from another.

After archaeological objects have been secured and studied, the problem of how the information contained in them may best be presented to fulfill the requirements we have just outlined confronts the archaeologist. Any final presentation of data attempted on the artifact level

must, as the previous discussion has indicated, be capable of considerable flexibility, and it must attempt to show the point, both in time and space, where a particular trait first appears, as well as its persistence in time, its evolution, and the directions of its spread. Any final system must also be able to show both divergence and convergence, or combination, of traits and complexes, both as regards area and time, before their relationships can be interpreted.

A simple method by which such characters may be represented, at least figuratively, is a group of cases containing a series of drawers. Each case is made to represent a prescribed geographical area with its complex of traits, and each comparable drawer a predetermined time period. Artifacts are placed in their appropriate drawers and cases, as collected. By simply pulling out all the lower or earlier drawers, and successively later ones, it is then possible to trace the development and spread of any desired trait, complex, or culture.

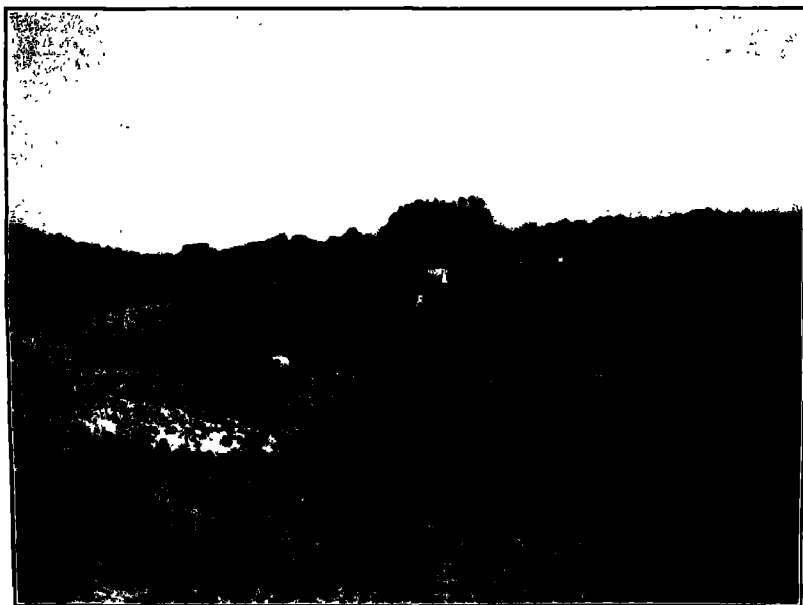
Up to this point, though aims and some methods have been discussed, nothing has been said about the actual means by which chronologies, or series of sequential events, are determined and established. In problems of chronology building certain definite methods have been found of the utmost use to archaeologists. Many of these methods have been borrowed from other sciences; some few have been developed by the archaeologist alone.

Geology and *palaeontology* may sometimes be a distinct aid to the archaeologist in determining chronology. This has been particularly fruitful in certain old world fields, but so far in this country neither has played any great part. *Palaeontology* has been an aid in determining the early date of the finds of human artifacts at Folsom, New Mexico, where arrow points of a distinctive type were found associated with a now extinct species of bison, as they have been found associated with extinct mammal bones in several other places throughout the country. *Geology*, particularly in recent depositional studies, has been of considerable aid in estimating the age of archaeological deposits. This has been especially useful in the dating of the recent Cochise finds, in southern Arizona and New Mexico, as well as certain deposits in Texas and other Southwestern states.

Distributional studies may be of value in reconstructing chronologies only in the most general manner, and then only if it be admitted that peripheral sites are of later periods than those of comparable culture nearer the center. Distribution studies, however, are of the greatest im-

portance in other work, particularly in the bounding of the area of a culture.

Typology, though often a great aid in chronology building, must be regarded with considerable suspicion. Typology consists merely of arranging a series of objects in some definite order, usually from simplest to most complex, on the basis of their physical characteristics alone. In such studies as ceramics it is often possible to construct a long series



A trash mound which has been trenched and from which stratigraphic sections have been removed for study. It is from such mounds as this that relative chronology may most easily be secured.

showing many variants, and where it is found by other methods that one end of the sequence is earlier than the other, a chronology may be established. On the basis of simplicity or primitiveness alone, it is impossible to be certain which is the earliest, for any trait or even cultures may "devolve" or degrade, as well as evolve or advance. Typological studies have their most immediate value in the separation and identification of various types within any series.

As has already been mentioned, *stratigraphy* has been, and still is, the backbone of any archaeological work when problems of chronology are

concerned. Although stratigraphy alone cannot give absolute dates, it can, and often does, result in very accurate and sometimes very microscopic relative chronologies. Not only is stratigraphy applicable to studies of trash mounds but it is equally of use wherever two separable horizons are discernible. Superimposed structures with their attendant culture may be separated and studied stratigraphically and even natural soil deposits may be defined and studied by this method.

Though stratigraphy is dependent upon the distinction of various layers in an accumulation, these layers do not necessarily have to be natural ones. Thus two types of stratigraphy are possible: what might be called *natural stratigraphy*, where already naturally formed distinct layers are present; and what might be termed *artificial stratigraphy*, where, in the absence of natural divisions, layers of a standard and convenient size are arbitrarily determined and blocked off, and the material

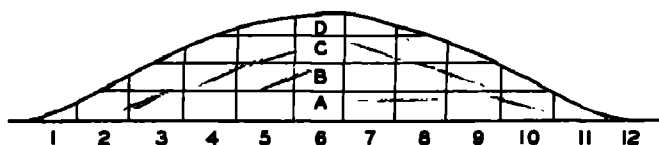


FIG. 9. A diagrammatic example of how a vertical face in the side of a trench through a trash mound is marked off in blocks for artificial stratigraphic study. From a base line half-meter sections are measured up and lettered progressively. These are divided into blocks one meter long which are numbered. Sections are removed from the face to a depth of half a meter. Any other convenient size block may, of course, be used. In this manner any specific block may be referred to at any time, such as layer C, section 5, or simply C5.

from each of these is treated as though it came from a natural layer. This method may often be preferable to dealing with the natural strata, for natural strata may occur for reasons of no significance to the archaeologist, whereas, if artificial layers or blocks of sufficiently small size are used, natural distinctions may later become apparent in them. Any natural stratigraphy present may also be utilized with the artificial strata, to complete the possible distinctions. The accompanying diagram, Fig. 9, illustrates the manner in which a section through a trash mound may be artificially split into strata and sections, with their accompanying specific designations, that artifacts recovered from any part of the mound may be relocated in their eventual study and evaluation.

In many stratigraphic studies great quantities of artifacts, particularly broken pottery fragments or "sherds," are recovered. After these have

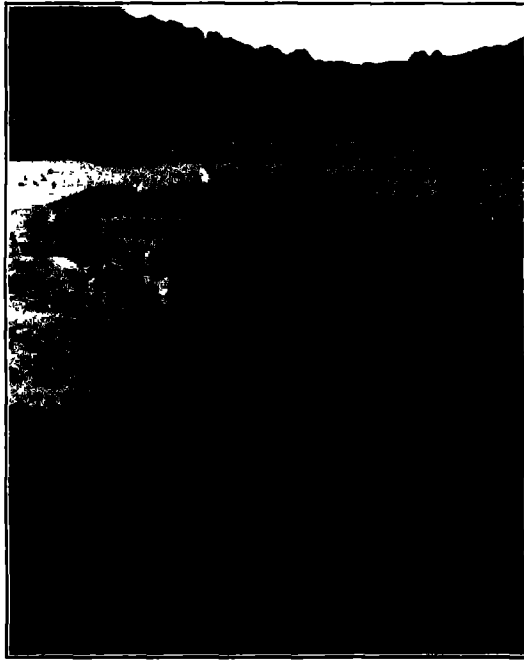
been typologically classified they are counted from each section and tabulated in relative abundance of occurrence on a large chart. An examination of this chart then shows in what section of the mound any specific type was most abundant in relation to all the others, and in this manner it is possible to reconstruct the order of building of the mound, or other accumulation, which is being studied. It is by such a combined statistical-stratigraphic method that most archaeological chronologies are built.

Data secured from a study of *annual deposits*, of various sorts, are another source of chronology building. In the Southwest the greatest single source of chronological data has proved to be actual dates as derived from tree-ring studies. Before the development of this method all estimates of time in archaeology were based on such indefinite methods as relative weathering, geology, or stratigraphy, and none of them resulted in very accurate guesses of age of ruins or cultures. With the development of tree rings, and the first actual prehistoric dates, these earlier estimates have, in general, been cut in half, or less. As much more is to be said concerning tree-ring dating in a later chapter the subject will not be discussed further here. Only one word of caution is perhaps necessary. The correlation of tree-ring dates with culture is often much more difficult than is generally realized, so that it is only after many dates have been ascertained and much study of culture has been accomplished that any dating is to be relied upon for specific details.

Glacial varves have been successfully counted back to several thousand years, but these are not available for study in the Southwest. Some similar work in dating has been attempted in the counting of what are apparently annual accumulations, or rings, in stalactites formed in caves, but situations where these are found covering or associated with culture are rare.

Under peculiar circumstances *documents* may be of some aid in establishing chronology in prehistoric periods, particularly in archaeological investigations of European cultures. In the Southwest, documents are of little value, for they either apply only to that period designated as historic, having been written by early European explorers, or are non-existent, for to date no native Indian writing has been found here. It is possible, of course, that some of the pictographs which are so common in the Southwest may some day be successfully translated and found to be a sort of writing, but so far what little work has been done on these objects indicates that they are simply clan or other symbols and

have no true connection with writing. Should these eventually be translated, somewhat in the manner of the stelae of the Maya Indians, they would be of the greatest value in chronology building. Typologically they may now be classified in the manner of pottery types, and thus are some indication of a chronology, though as yet not a very complete or specific one.



Courtesy of the Museum of Northern Arizona

Horizontal trash accumulations such as this are often found spread over wide areas. When carefully trenched as shown here they may give as good stratigraphy as vertically accumulated mounds.

Probably the most generally used method of the archaeologist everywhere is what is here termed *seriation*. *Seriation* may be defined as the correlation of various series. By this it is meant that as various series are worked out they may be checked against each other, to build eventually a much more complete chronology. If pottery typologies, house typologies, basketry, and sandal typologies are worked out and correlated with annual deposits, stratigraphy, and perhaps the chronologies indicated through geological and palaeontological studies, and if everywhere

in this correlation there is no difficulty in making comparisons, then the final chronology has just that much more likelihood of being authentic.

The scientist is at all times looking for every check to substantiate, or even refute, his findings. For this reason it is his problem to examine every available bit of information before he gives a final decision. It is this combination of all sources of chronological data that is seriation.

One of the most fruitful sources of correlation, or cross dating of series, is the finding of trade objects in various sites. As a rule trade pieces appear to have been rapidly moved from one region to another, so that any lag in their travels is more or less negligible. Certain outstanding types of pottery were widely traded throughout the Southwest, and these have become almost the equivalent of key fossils in dating from one section to another. An example of such a type is what has been called, in general, Little Colorado Polychrome. This beautiful orange-base pottery, though made in the Little Colorado River drainage area, was traded as far south as Mexico, throughout the entire desert, mountain, and plateau areas, and is one of the best dating types in regions where no tree-ring dates may be secured.

Once typologies of various objects have been worked out and dated, either exactly or relatively, they may, by correlation with associated materials, in turn date them, and so spread until large areas have finally been dated. It is somewhat in this manner that much of the Southwest has finally been relegated to dates in our own calendar and a chronology of absolute dates of culture established, so that the first step is taken in the creation of history from prehistory. As has been repeatedly suggested, the interpretation of relationships represents the final step.

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Chapter IV

CLASSIFICATION

One of the most difficult problems in any science is the establishment of a workable classification, or division of the study into various parts, that these parts may more readily be examined and compared. As any such divisions must of necessity have artificial delimitations, it is possible to construct classes on various bases. In any study of peoples three factors must be taken into consideration: time, space, and culture, or more specifically the temporal, spacial, and cultural factors. As most of our work in archaeology in recent years has been an attempt to establish cultural chronologies in various sections of the Southwest, the prevailing tendencies have been to stress the temporal in a classification, and then to point out its application, through correlation, to various other geographical regions.

In 1927 a group of archaeologists met in conference at Pecos, New Mexico, with the hope that through an interchange of ideas by various field workers some more organized sequential classification of Southwestern archaeology could be effected. A general cultural classification was quickly proposed, which, in its completed form, was briefly summarized by Dr. A. V. Kidder, and presented in *Science* in 1927. This classification, based solely on material derived from the plateau section of the Southwest, originally was intended as a simple division of the evolutionary sequence of culture as represented in this section into identifiable divisions. It was solely a cultural classification, made up of culture stages, which in the most general manner formed a sequential development, and was not intended as a division of Southwestern pre-history into time periods.

Since 1927 various modifications and additions have been made to the original classification, as it has been applied by different workers. The terms and the order of divisions have persisted, but there has been a tendency for each individual to add to or modify the classification according to his own particular needs. The increasing importance which

pottery has assumed in archaeological studies in the Southwest has led to placing more stress on this one trait by many people. In fact, it has become the popular determining criterion for stages.



This picture shows a trash mound which has been dug by untrained and unauthorized individuals searching for pots. Any stratigraphy which it might have contained is now irretrievably lost.

The classification as presented below has been revised from the original as summarized by Kidder in *Science*, Vol. 66, No. 1716, by the addition of features which the writer has found most useful. These additions, largely consisting of pottery types and characteristics, are included as an aid to ready correlations with other classifications. They are also useful in correlating reports of field work which were published before the more general adoption of the Pecos terms.

THE PECOS CLASSIFICATION AS SOMEWHAT REVISED BY USAGE

Basket Maker I or Early Basket Maker. A postulated stage, pre-agricultural, yet adumbrating later developments.

Basket Maker II or Basket Maker. The agricultural, atlatl-using, non-pottery-making stage, as described in many publications.

Basket Maker III or Late Basket Maker or Post Basket Maker. The pit or slab-house-building, pottery-making stage (the three Basket

Maker stages were characterized by a long-headed population, which did not practice skull deformation). Pottery is characterized in general by coarse lines, simple designs, many basket designs, and some crude life forms, generally a relatively coarse paste, and globular forms.

Pueblo I or Proto-Pueblo. The first stage during which cranial deformation was practiced, vessel neck corrugation was introduced, and villages composed of rectangular rooms of true masonry were developed (in some areas). It was generally agreed that the term pre-Pueblo, hitherto sometimes applied to this period, should be discontinued. Introduction of slips on pottery, burnishing, designs characterized in general by very fine lines, attached dots, and high triangles in the black-on-white types.

Pueblo II. The stage marked by widespread geographical extension of life in small villages; corrugation, often of elaborate technique, extended over the whole surface of cooking vessels. Black-on-white pottery types characterized in general by simple designs in wide lines, long flattened triangles with occasional attached dots, and rudimentary interlocking frets.

Pueblo III or Great Period. The stage of large communities, great development of the arts, and growth of intensive local specialization. The first introduction of polychrome types of pottery and a general marked decrease in the importance of corrugated types.

Pueblo IV or Protohistoric. The stage characterized by constriction of the area occupied; by the gradual disappearance of corrugated wares; and, in general, by decline from the preceding cultural peak. In many instances the implied cultural decline is not strictly true. Widespread use of polychrome pottery and the introduction of glazed paints.

Pueblo V or Historic. *The Period from A.D. 1600 to the Present.* Dr. Byron Cummings has developed a second classification which he has used with much success with his students. This is based on a development of house types which he has characterized and correlated with sufficient other cultural material to make the identification of his stages clear. The classification, as given below, is in outline form, no attempt being made to include all its detail.

THE CUMMINGS CLASSIFICATION

Briefly outlined, and corrected to the system as presented by Dr. Cummings at the A.A.A.S. meetings in Flagstaff, spring of 1936.

I. Archaic Period. A period designed to cover the early, postulated, nomadic group.

- A. Brush Shelters in Caves. Used caves for homes, in which they had only nests so built no true homes, although caches, some slab lined, were abundant.
- B. Brush Shelters in Open. Homes apparently of same type, and caches definitely of type above.

II. Early Pueblo Period (Pithouses) .

- A. Circular Pithouse Period. Houses circular and sunken, with walls of dirt, clay plastered, or reinforced with stone, and roofs either flat or dome shaped.
- B. Transitional Stage. Houses of semi-rectangular rooms with distinctly rounded corners.
- C. Rectangular Pithouse Period. Houses rectangular and sunken, walls of dirt, clay plastered, or reinforced with stones, and flat roofed.

III. Late Pueblo Period (Surface Structures) .

- A. Small House Structures. Single structures built near each other, usually of not more than two rooms joined, in an irregular group with no plaza, and apparently no associated kivas.
- B. Unit Type Villages. Houses and rooms joined in various shapes such as L, D; they may or may not be two stories high, with a plaza, often partly surrounded with rooms, in which is generally found a kiva.
- C. Rambling Villages. Small units of houses which are not arranged in compact masses or in predetermined orientation.
- D. Compact Villages. Community houses, or one building group composed of many rooms. Examples of this type are Pueblo Bonito, Betatakin, and Kiet Siel. This division may be further subdivided, on the basis of geographical locations, as follows:
 - 1. Cliff Pueblos.
 - 2. Mesa Pueblos.
 - 3. Valley Pueblos.
- E. Compounds. The type of structure found in the Upper and Middle Gila regions. These are composed of irregular masses of rooms of odd shape, enclosed within a surrounding wall.

In 1932 W. C. McKern first proposed a classificatory system for the Midwest. This system was discussed by archaeologists at the University of Chicago later in the same year, and again in 1935 at the science meet-

ings at Indianapolis. As a result it has become more or less standardized and is now in general use in that section. It represents an attempt to produce a general classification which will be usable in any section, and in the classification and comparison of any culture. It is based on a grouping by similarities of all the diagnostic culture traits of all the sites to be included in the comparison. Thus it is unlimitedly expandable, and this characteristic has been much stressed in discussions of its value.

The proponents of this system have not been willing, as yet, to admit any implications of geographical location or chronological position, being content solely with the statement that one site or culture is similar to another or different from it. Used in this manner its chief value lies in the early stages of archaeological work in any particular region, before geographical divisions or chronological sequences are developed, although it is expected that both will emerge from it. For this reason it is of little immediate value to the purely Southwestern archaeologist.

Briefly outlined the McKern classification is somewhat as follows.

- I. Component. Manifestation of a culture as represented at a single site.
Two or more components may be present in a single site. This is the smallest division of the series.
- II. Focus. A group of communities with a preponderant majority of determinant traits in common.
- III. Aspect. A group of communities having an approximate majority of determinant traits in common.
- IV. Phase. A group of communities which have a significant, but minor, number of determinant traits in common.
- V. Pattern (previously termed basic culture). A group of communities which have in common only fundamental, or essential, determinant traits.

As the above classification has been set up it is difficult for the writer to visualize the various divisions suggested. The greatest single difficulty appears to be the identification of what are determinant traits.* In an effort to obviate this difficulty a conference was held with Dr. Carl Guthe, one of the original sponsors of this classification, in which he

* Determinant traits have more recently been defined as recurring traits, or those traits which persistently recur in certain associations.

finally suggested that all the available and comparable traits be considered, and that the divisions be based on the percentage of those traits which were found to be common to various sites. His suggestions are listed below.

- I. Component — 85 per cent or more of traits in common.
- II. Focus — 65 to 85 per cent of traits in common.
- III. Aspect — 40 to 65 per cent of traits in common.
- IV. Phase — 20 to 40 per cent of traits in common.
- V. Pattern — 20 per cent or less of traits in common.

This would seem a much more specific and usable method of classification, for much of the variable human element would be removed with the absence of the necessity of determining what constitutes a diagnostic trait.

More recently H. S. Gladwin, at Gila Pueblo, has proposed another system of classification. It is a system of roots, stems, branches, and phases, which are cumulative and show most clearly the affinities and derivations of any portion of the Southwest at various periods. The Gladwin system embodies the three necessary elements to any archaeological work: culture, time, and place, and as represented in chart form shows the derivation or genetic relationships of each of the phases.

Probably the main criticism of the Gladwin system is the choice of linguistic group names applied to the roots. However, a careful perusal of the writings of the various staff members of Gila Pueblo will make it evident that these are not felt to be too ironclad in application. Actually the series of units in the Gladwin system and those in the McKern system are much alike. Both are divided into units based on cultural similarities and differences, which are derived from individual traits, and both have a series of categories running from small to increasingly large, wherein several of the smaller units go to make up the next larger. It is only in interpretation that the Gladwin system is basically different.

With the addition of components, borrowed from the McKern classificatory system, it would represent probably the most useful and perhaps the final form of a classification where detailed comparisons are necessary. Slightly revised, it will probably become the tool of the Southwestern specialist, but, because of its very advantage to him (its detailed complexity), it cannot be the medium of comparison of the beginning student.*

* For a more detailed discussion of the McKern classification see Cole and Deuel, as listed in the references at the end of this chapter; and for a complete discussion of the Gladwin classification see Gladwin, listed there, or any of the Gila Pueblo reports since 1934.

Soon after Hohokam Culture was established as that culture characteristic of the desert section, Gila Pueblo proposed dividing it into a series of broad sequential divisions. As in the Pecos classification, these divisions have been correlated with dates. Phases make up local subdivisions of the larger groupings to serve as more detailed bases of study. However, for the purposes of this book the broader period classifications will be found most useful.* These six period names are characterized by pottery types and other associated culture traits, so that in general they may be easily and definitely identified. They are:

- VI. Modern Period — A.D. 1700–1900
- V. Recent Period — A.D. 1450–1700
- IV. Classic Period — A.D. 1100–1450
- III. Sedentary Period — A.D. 900–1100
- II. Colonial Period — A.D. 500–900
- I. Pioneer Period — A.D. 1–500†

Since the inception of Southwestern archaeology a great number of different classifications have been advanced at various times by different individuals, each of which has been based upon one trait or a combination of traits, and to which other data have accrued as necessity demanded. As time went on, and knowledge of the various culture stages became more complete, these classifications have had to be altered to fit the newer conditions. Always they have been of two types: those of complicated detail, which are the bases upon which advanced research is accomplished; and those of a much more general nature, which have served to introduce beginning students to the subject. As it is this second class which most nearly fulfills the requirements of this book, and because only the first two classifications mentioned fall definitely into this group, we shall be primarily concerned with only these two.

Any direct merit comparison of the Pecos and Cummings classifications is almost impossible, for they are based on two different types of material which have been repeatedly found to vary regionally. The present tendency to trace pottery types as a diagnostic of culture stages is an outgrowth of the recognition of the extreme sensitivity of pottery to change. Probably more than any other culture trait pottery has been

* Although these are called periods in the publications of Gila Pueblo they are actually stages of culture to which dates have been correlated, and will be so called in later chapters of this book.

† Although Dr. Haury is inclined to list the beginnings of the pioneer period at 300 B.C. I have placed this beginning date as about A.D. 1, for reasons that will be more fully discussed later in this book.

found to reflect minute temporal and areal differences, though at the same time carrying broad design similarities widely throughout the Southwest. With the recognition of this, many more advanced research workers have come to regard pottery types as the best diagnostic of the various divisions of the Pecos classification, particularly where it has become necessary to subdivide its stages further.

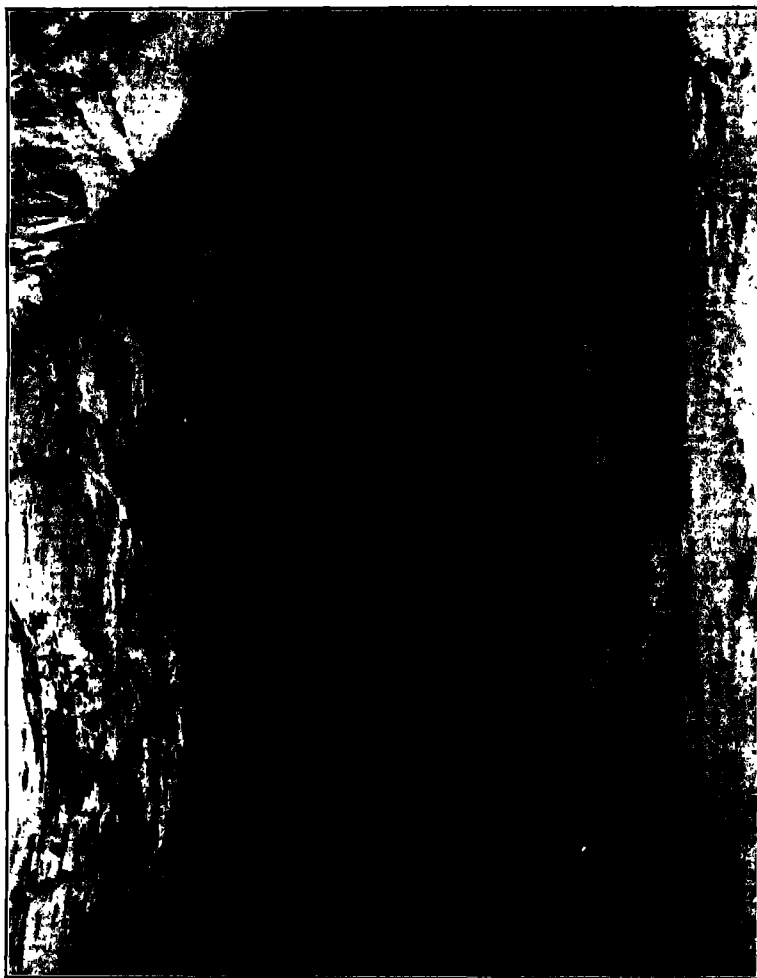
However, it has been found that though any one trait, such as pottery, does follow a definite sequence in any particular region, other traits may not consistently correlate to it. This has been found true when house types and pottery types have been compared from two regions, an excellent example being Chaco Canyon and the Flagstaff area. In Chaco Canyon a general Pueblo II type of pottery is associated with great multiple-roomed and multiple-storied pueblos, but near Flagstaff it is found with single-room pithouses.

As the ultimate purpose of the Southwestern archaeologist is to build history backwards into unknown periods, and as history must be based as nearly as possible on time development, a chronology based purely on pottery will not always prove entirely correct when other traits are added to it. Even some pottery types lag regionally or are not introduced quite so early in one section as another.

Because the Pecos classification was originally drawn up by workers most familiar with the plateau, particularly the San Juan Drainage, it was based on the archaeology of this region. As a result it can be extended to the mountain and desert areas of the Southwest only with considerable effort at correlation. Although some further criticism has been directed at the inflexible numerical terms designating the divisions, probably this is actually of less concern than is implied, for if the culture stages hold universally applicable the names may logically be anything.

Since the Cummings classification is a relatively simple one, and because it can readily be extended to cover the entire Southwest, it is valuable. Practically all types of houses ever constructed in Arizona may be grouped under this classification, and so it has a universal value to beginning students, but because of its very broad groupings it is not of as great value to highly advanced students as one based on more complex data. Although house types in general follow a developmental sequence they seem to vary locally, and under unusual conditions, more markedly than such other traits as pottery types.

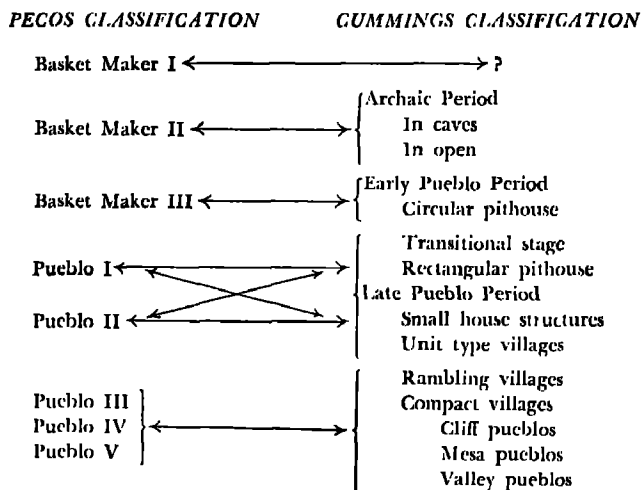
Though neither of these classifications ideally fulfills all our requirements, both are invaluable to such a study as this. Therefore, whenever



Kiet Siel cave and Pueblo. This is the largest cliff pueblo in Arizona.

a characteristic house type is to be described, it will be characterized under the terms of the Cummings classification, with only the rare variations from the usual noted. In referring to the broad stages of culture development the terms of the Pecos classification will be used, as well as for a broad identification of a general complex of pottery types. Thus we may speak of a site as a cliff pueblo, and refer to its general culture and pottery combination as being Pueblo III.

Although it is almost impossible to correlate any two systems of classification accurately, because of the regional and time variations which will be found, it is possible, in the most general manner, to indicate somewhat comparable situations where they exist. This has been attempted below for the two classifications, as regards the Plateau section.



Throughout this discussion two basically important factors have been referred to repeatedly. These are the three dimensional variations which must occur in any consideration of culture in relation to space and time. Of all possible bases of correlation only one remains constant, though indefinitely expandable or divisible, and that of course is time. This has been arbitrarily set in definite divisions, with which we are all commonly accustomed to correlate events, so that an ideal classification would be one based solely upon this one element.

Until very recently absolute dates which could be correlated with archaeological events covered only about two-thirds of the archaeological

stages of northern Arizona, making it impracticable to attempt a classification based solely upon this element. However, in March, 1935, Dr. A. E. Douglass extended his tree-ring chronology to cover all time from the first century A.D. to the present. This makes possible the dating of all major culture stages now well recognized and thoroughly characterized in the plateau area. Although these dates are at present somewhat scattered regionally, conditions in various areas may be compared by correlation of similar traits. As a result, from this point on, arbitrarily chosen time periods will be set up and used as the basis of discussion, and to these established periods culture developments from various areas will be correlated. The latter part of this book will be devoted to a discussion of culture, as based on these time periods, in which the culture will be reviewed by regions.

In the following list of periods an attempt has been made, in the most general possible manner, to indicate roughly the nature of the culture which existed at the time stated. It is impossible to give more than an indication of culture, and although these suggested characterizations will probably seldom be referred to in later chapters they might be of some immediate value in fixing in mind a general picture of culture evolution in the Southwest.

About 8,000 years ago — Ancient Stage, Cochise Culture.

8,000 to 2,000 years ago — Hunter Stage, newly discovered later Cochiselike culture.

A.D. 1 to 300 — Pioneer Period, in the desert area only.

A.D. 300 to 500 — Founder Period.

A.D. 500 to 700 — Settlement Period (in northern Arizona the latter half of this period might be regarded as a transition period).

A.D. 700 to 900 — Adjustment Period.

A.D. 900 to 1100 — Dissemination Period.

A.D. 1100 to 1300 — Classic Period.

A.D. 1300 to 1600 — Culminant Period.

A.D. 1600 to 1900 — Historic Period.

1900 to the present — Modern Period.

It must not be forgotten that the actual tree-ring dates cover only the period from A.D. 11 to the present, leaving the earliest two of these period divisions with no true dates. The time from A.D. 11 to about 300 is also poorly correlated with culture, so that the earliest reliable culture dates begin shortly after about A.D. 300. The Ancient and Hunter periods have been called stages in this outline, for they are based on estimates of time derived through geological processes and not tree rings.

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Chapter V

DENDROCHRONOLOGY

At a small archaeological conference at Gila Pueblo (April 16-18, 1931), it was decided that the establishment of a chronology of southwestern archaeological periods should be based on: first, tree-ring dating; second, stratigraphy; third, cross dating; and last, intensive analysis. This places dendrochronology, or a chronology built up as a result of the study of tree rings, as the most desirable of all means of establishing a series. Such a decision is wholly justified, for it is through this medium alone that individual ruins may be absolutely dated to within the year, and sometimes the season, in which they were built. The duration of occupancy may often also be determined, with the various periods of building activity or repairs, and the approximate time of abandonment or destruction.

Dr. A. E. Douglass, an astronomer at the University of Arizona, conceived the idea of tracing climatic factors in tree growth in the arid Southwest, with the hope that sunspot activity affecting climate would in turn be reflected in the growth of trees. With a purely climatic objective in mind he first seriously began work on the yellow pines of the Flagstaff and Prescott areas in January, 1904. For this study he chose recently dead or still growing trees, and starting with outer known yearly rings was able to count back some five hundred years. After counting several of these sections he soon realized that certain yearly rings were always of a definite relative size, as compared to the preceding and following rings. With recognition of this simple fact it was possible to carry the characteristic ring sequence in his head, and to date early portions of the series by recognizable characteristic ring sequences, even though the date of the outer ring of the specimen being studied was not known.

His next field of investigation was the giant sequoias of California, where, with the same direct comparison method, he succeeded in building a sequence of over three thousand years which was based on some thirty-five specimens. The results of this work disclosed that, although

the trees of Arizona and California showed certain similarities, they were not identical in individual ring characteristics.

It soon became apparent that in order to extend the yellow pine record it would be necessary to find older sources of material. At about this time Dr. Wissler offered to send for examination quantities of wood material gathered from prehistoric ruins in the Southwest. This offer was promptly accepted. The direct comparison method was also used in a study of this material, and it was found that the various prehistoric specimens correlated with each other as readily as the historic ones had done.

With this encouragement Dr. Douglass began work on the yellow pine in earnest and in 1919, in a letter to Dr. Wissler, outlined the bridge method of "cross dating." This was based on the recognition that characteristic ring sequences of as little as thirty or forty years were never

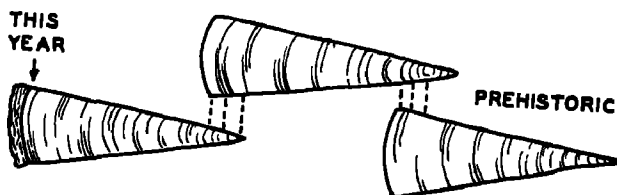


FIG. 10. Diagrammatic example of the bridge method of chronology building. The pie-shaped section to the left was cut in this year, and carries a ring sequence back to early historic times. By correlating these inner rings with the outer ones of the center piece the series is carried back to prehistoric times. The second bridging, or "cross dating," then gives true dates to the third specimen, which is from a prehistoric ruin.

exactly duplicated by the trees, and that certain short sequences might always be relied upon in crossing or correlating two specimens. Thus it was only necessary to correlate the inside rings of one specimen with the outside rings of another slightly older, and so build up a long chronology of fragments or individual pieces. By this system various independent records were established which had not, as yet, been connected to the later material bearing absolute dates.

Through the medium of lectures and publications, interest in the study of tree rings became widespread, and Neil M. Judd, who at that time was working at Pueblo Bonito under the auspices of the National Geographic Society, sent Dr. Douglass quantities of beams from that site. His work on this material was so satisfying to the society that funds

were later secured from them to carry on the field and laboratory research.

In the spring and summer of 1928 Dr. Douglass secured the services of Mr. Hargrave, then a student at the University of Arizona, who, in an attempt to bridge the existing gap between the prehistoric chronologies and the earliest absolute dated series, collected beams from the Hopi towns. However, the dating of this early material was not accomplished until the following summer (1929), when another National Geographic expedition headed by Hargrave and Haury undertook excavation at Pinedale and Sholow ruins. Here a charcoal beam was uncovered which brought the two long sequences together by bridging the gap between them, and a great many of the large pueblos in the Southwest were assigned to dates in our own calendar. At the same time a continuous absolute chronology was carried back to A.D. 700. Among the great ruins at once dated were Pueblo Bonito, Aztec, Mesa Verde, Betatakin, Kiet Siel, Kokopnyama, Kinteel, Wupatki, Sholow, Pinedale, and about thirty others.

In the fall of 1930 Dr. Douglass gave his first course in dendrochronology to a group of students at the University of Arizona. This course has subsequently been given many times either by himself or by others with the result that a large group of tree-ring students have been instructed in tree-ring dating. These students, scattered throughout the Southwest, have assisted in the dating of a large number of additional ruins. Although Dr. Douglass began his study of tree rings as an aid to climatic studies, and though tree rings have materially contributed to climatic knowledge, its chief contribution has been in the dating of prehistoric ruins. As has already been pointed out, it was necessary early in tree-ring work to turn to archaeology as an aid to the extension of chronology, and in so doing many ruins incidentally were dated. With a realization of the value of such studies to archaeology, the archaeologists quickly looked to it for aid. Many of the archaeological students whom Dr. Douglass trained in tree-ring work have turned to it to solve their archaeological problems in various portions of the Southwest.

Besides the University of Arizona, the leaders in this dating work have been Gila Pueblo, the Laboratory of Anthropology, the University of New Mexico, and the Museum of Northern Arizona. Workers in each of these institutions have succeeded in dating many ruins, with the result that at the present time so many dates have been secured that it has become almost impossible to keep track of them all. In an attempt to

keep somewhat abreast of the developments in tree-ring work, a new publication, the *Tree Ring Bulletin*, was established in the summer of 1934, wherein it is hoped that all dates from ruins will eventually appear.

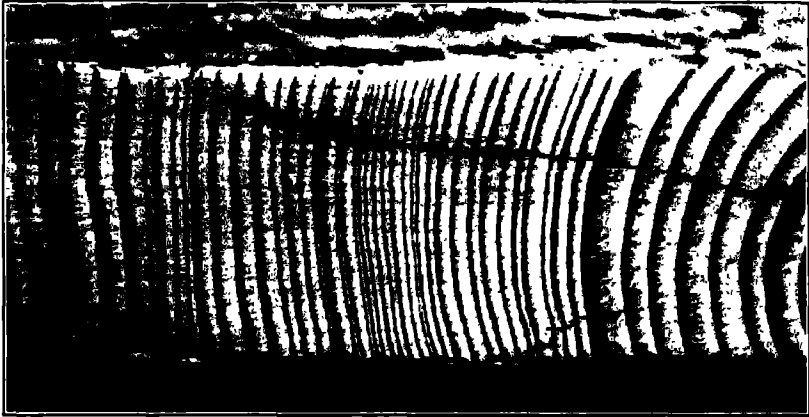
Much of the effort of Dr. Douglass and the various other workers in the field has been directed during the past several years to an extension of the chronology before A.D. 700. Quantities of material gathered by Earl Morris and other workers in the four corners district (Arizona, New Mexico, Colorado, and Utah) were in the possession of Dr. Douglass and had enabled him to build a chronology of several hundred years, but this was not crossed into the dated series which ended at A.D. 700. Dr. Hawley working with beams from Chetro Keti succeeded in extending the chronology to about A.D. 645, and the Museum of Northern Arizona added a few years to this, but still did not succeed in bridging the gap. It was not until March, 1935, that a charcoal fragment, this time a split plank, collected by the Museum of Northern Arizona near Flagstaff, succeeded in definitely bridging the gap. This brought in the earlier series from northeastern Arizona, and once more extended the chronology, now well into the first century A.D.

With this accomplishment all the major culture stages which had been recognized in northern Arizona were dated, making possible the outline of study, based upon actual dates, which will be followed in this book.

The importance and possibilities of tree-ring dating can be grasped only when something of the methods and materials employed is understood. Many trees, such as the yellow pine, annually add one ring of growth. Growth begins shortly after the flow of sap in the spring with large thin-walled cells which in section are light yellowish in color. This cell growth continues throughout the summer, but as colder weather in the fall approaches the cells become smaller and heavier walled, until at last growth stops with the retreat of the sap, and a reddish smooth line is formed at the outside of the ring. This cellular growth, falling between the smooth regular line formed by the outside edges of the harder fall growth, represents one annual ring.

In the semi-arid southwest, and with trees growing under normal or average conditions, seldom, if ever, is there sufficient rainfall to enable the tree to enjoy its maximum possible growth. When an unusually dry season occurs, all or most of the trees in a given area will show small, or perhaps microscopic, rings for that year.* The reverse, of course, is true in an unusually wet season. As the small rings are most striking, abun-

dant, and consistent in this section of the country, they are used as guide or determining rings, and the tree-ring chronology, as already mentioned, has been built up on a notation of their occurrence.



Courtesy Tree Ring Laboratory

FIG. 11. Section of a tubular boring from a prehistoric Douglas fir beam. From this it may clearly be seen that it is the small, irregularly spaced rings which are the most distinctive and form the basis of tree-ring dating.

Early in his work on cross dating ruins Dr. Douglass, realizing that some mechanical aid in recalling relative ring size would be of the greatest help in dating ruins, developed the short plot. This consists of a narrow strip of graph paper upon which each vertical line represents a year, every ten being indicated with a date written upon the slip. See Fig. 12. At each yearly ring that is noticeably minute, a long vertical line representing the ring is drawn down from the upper edge of the strip. Rings of varying size are depicted by lines of different lengths, the longest line for the smallest ring, very large rings being indicated by a *B* in their proper position.

When a new undated specimen is being studied, in which a date cannot readily be recognized by memory, a plot is made of its character-

* Dr. Douglass's original efforts were directed toward a correlation of tree growth and climatic factors, which he felt would be the result of sunspot maxima and minima that were known to occur in cycles. In demonstrating the validity of this contention he has been very successful, establishing a definite relation between the two phenomena and indicating a cycle of approximately eleven and a half years, with lesser or greater cycles forming subdivisions or multiples of this period.

istics from the inside (or from left to right), to its last ring on the outside. This short record, with the piece number attached, is then slid along the main composite or key plot until it matches. A second review of the specimen may then be undertaken to check with the other dated pieces covering this time section, and if it closely matches the records

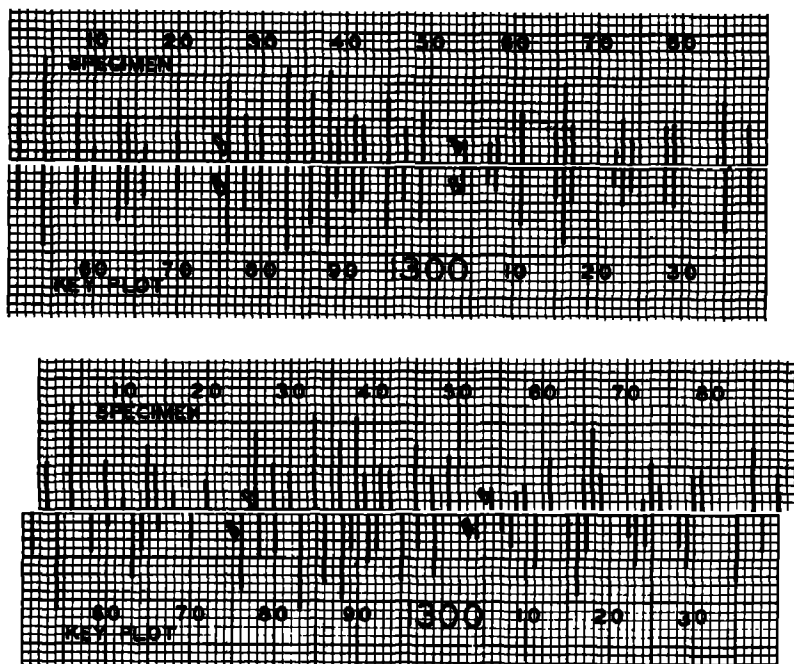
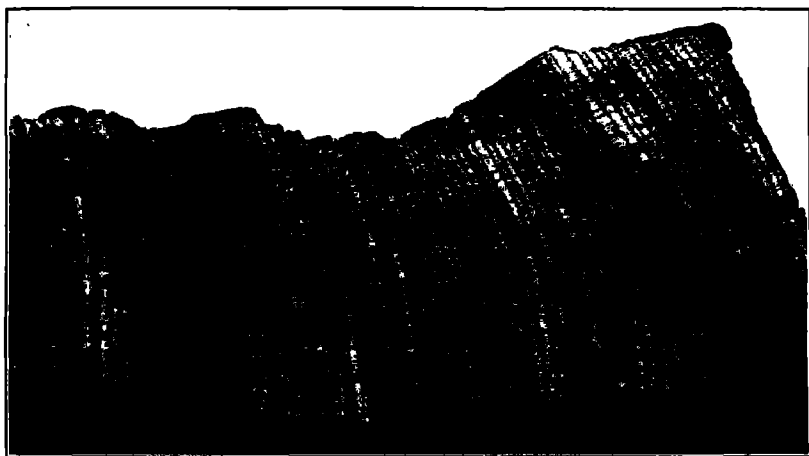


FIG. 12. Example of cross dating by short plots. The key plot is a compilation of a large series of specimens, noting their most distinctive characters. The specimen plot above, in the upper figure, has been slid along the key plot until the two records match, thus giving a date, in this case A.D. 1340, as the outside of the specimen record. The lower example shows the specimen plot shifted right two years, completely destroying any semblance of correlation. Thus a characteristic specimen may be dated with absolute certainty at one point on the key plot, and nowhere else.

represented by them it is obviously dated. Usually, by double checking, a date is established beyond any question of doubt, as is indicated by the two cuts showing dating by short plots in operation. It must be remembered that over a considerable period of years at no point has the record ever been found to duplicate itself.

Certain kinds of wood are much more adaptable to dating purposes than others. Yellow pine has been found to be the most valuable, because it is widespread in range over the Southwest and because the rings are regular in circumference and usually well marked. Douglas fir probably ranks second, and may usually be distinguished from pine by the rings, which are very well marked and strongly contrasted. Piñon from certain sections has been found usable, generally only after much study,



Courtesy Museum Northern Arizona

FIG. 13. One of the exceedingly rare specimens of juniper which gives a characteristic, and easily dated, record. This piece is from Kiet Siel Ruin in Tsegi Canyon.

but an increasing number are now being dated. Piñon rings are much fainter than those of pine. Juniper, although it is widely distributed in many parts of the Southwest, was not generally used by prehistoric builders where straighter and better poles, such as pine, could be obtained, but does occur in abundance in some sites. It is seldom found to be datable; it may be characterized as having an eccentric center and hair-like, almost microscopic, rings, with probably many absent. Cottonwood, because of the large and uniform size of the rings, has been found to be of no dating value; the same is true of Engelmann spruce.

At first it was felt by Dr. Douglass that it was necessary to have full sections of preserved beams which represented long sequences before it was possible to date specimens accurately. Full sections were considered necessary in order that the entire ring circuit might be studied to locate

traces of rings which were absent from one part of the section or another, and to give more definite data on the rare double ring (two false rings in one season). However, with increasing familiarity with the various sections of the chronology, it was found that lost rings could be readily accounted for, and that doubles could generally be recognized with some ease. The result was that radial sections were entirely datable, and further investigation showed charcoal was equally valuable. This immediately opened a much larger field for dating operations, including all those sites in the open where wood would not survive but where burning preserved charred beams or portions of beams.

Various methods for the field collection of tree-ring material were soon evolved. It was a simple matter to saw a full section from one end of a preserved wood beam, in a cliff dwelling or other sheltered section, which protruded sufficiently beyond walls or were loose in collapsed roofs. For a huge log it was often simpler to choose one portion of the radius and make a V-shaped cut in one end from the side to past the center, thus removing a long triangular strip which might easily be prepared and read. But for peculiar situations, such as beams still supporting roofs in standing dwellings, Dr. Douglass evolved a tube with a set of saw teeth on one end and a bit head fastened to the other. This implement, operated in a common brace, will remove a core from beams which cannot otherwise be collected. At best this method is long and tedious, and almost never can the core be broken off and removed whole.

Charcoal, on the other hand, because of its very fragile nature, must be prepared in the field by quite different methods. Most charcoal, because it is found buried in damp earth, will crack when exposed to the air and allowed to dry. Therefore it must be quickly soaked in some preparation to prevent its disintegration. So far the best preparation which has been found is a solution of gasoline and paraffin, in which the newly removed charcoal is placed until it stops bubbling, when it is set out in the shade to dry. The gasoline tends to carry the paraffin into the charcoal during immersion, and to drive out the water, after which the gasoline evaporates, leaving the charcoal impregnated with paraffin which acts as a binding material. In dealing with very fragile and thin charcoal planks, or similar material, it is necessary to uncover one side and coat it with a thick shellac which is allowed to dry; the specimen is then carefully turned over and coated on the other side, before it may be handled. This is also true of semi-rotted wood. In handling excep-

tionally fragile specimens it is often possible to slip a piece of thin wood or cardboard under the charcoal after shellacking one side and then to tie the specimen to the board with string. All specimens should be carefully wrapped in cotton, tagged, and stored in boxes for transportation from the field. Extreme care is necessary in the collection of such material, as charcoal is prone to shell off from the outside, and it is the outside date that is most important for archaeological purposes.



General view of Kiet Siel cave. This is typical of the larger sandstone caves of north central Arizona. Kiet Siel is the largest cliff pueblo in Arizona. Many dates have been secured from this site.

A careful tagging and noting of the actual location of the specimen in the ruin, its attitude in relation to other beams, and similar information are absolutely necessary at the time of collection. If time is not taken to note fully the relation of the beam to its surroundings the date which may later be derived from it will be of little or no archaeological significance.

The preparation of wood for dating in the laboratory consists of shaving down a sectional surface with a safety razor blade. A new sharp blade has been found to give a better, clear, readable surface than any other easily accessible instrument. The cut should preferably be at a slight angle to the true section of the piece, to reflect light best. As an aid to bringing out rings for reading a small quantity of kerosene may be applied to the surface with a daub. In preparing specimens for display, or even in reading some few sections, the surface may be ground down and polished with fine sandpaper, and the finish may best be preserved with a coat or more of flexible collodion.

The best surface in charcoal is that which results by simply breaking the specimen across the grain. When first broken in this manner the rings stand out in very clearly defined relief, but much handling or continual reference to the record results in a dimming of this surface and the necessity of a new break. In some specimens, particularly where the rings are relatively large or distinct, a new razor blade may be relied upon to prepare a surface, but as the charred cell structure is very brittle it tends in any event to blur the record somewhat. Very fragile specimens may be further strengthened at this time by partially embedding in a block of plaster, coating with shellac or some hard wax, wrapping in gauze, and tying with an abundance of string, or by any similar method. Very fragile pieces of wood may be treated in much the same way.

Not every piece of wood or charcoal shows ring characters which permit dating. Studies undertaken by Dr. Douglass indicate that certain locations are decidedly unfavorable to the formation of datable sequences whereas certain others are favorable. Trees which grow on steep slopes, narrow hilltops, or in very rocky soil, where runoff is rapid and soil water sparse, are inclined to show supersensitive records with many rings absent in years when no growth took place in the stem of the tree. Others growing near the bottoms of valleys or on the banks of streams or in springs or similar spots have such an abundant permanent supply of water that their rings are all more of a size, and thus are called "complacent" or "uniform," and are undatable. The ideally situated tree is one growing in good soil conditions, with runoff but not too steep a slope, so that most of the water which falls is utilized. For such a tree the record is sensitive, with few or no rings lost, and yet the rings have sufficient character or variation in width to make them easily datable. Recent investigations carried on by the Museum of Northern Arizona

indicate that small areas of rugged topography may lead to considerable variation in ring sequences, causing difficulty in assigning dates, although the records appear in every way normal and excellent.

The number of rings included in the specimen is obviously important in determining its datability. Unless unusually strong and easily recognizable ring groupings are present, sequences of less than twenty-five or thirty years are undatable. A really excellent piece will cover anywhere from sixty to two hundred years, with an average ring size which is easily discernible under a six-power lens. Branches of trees are often difficult to date, as rings are inclined to be absent or double, and the center of growth is seldom the center of the branch, thus making a variation in ring size in the circuit of the piece. Charcoal fragments, which were probably largely branches and small bushes and trees, and were used as firewood before being thrown into trash heaps as coals, too often are so far from actual outsides that they are not of much real value to the archaeologist. These fragments are partially consumed as wood in the fire before they have formed charcoal and are thrown out.

All tree-ring specimens which are collected at a site in the field should be sent to the laboratory, for much valuable information may be gained from them, even in the present early stage of tree-ring studies. The kind of wood may often be identified from the charcoal pieces even of fire sweepings, and a careful notation of the wood types will give much valuable information concerning the ecological conditions under which the pueblo existed. Frequently the brush, sticks, and splints included beneath the plaster and above the beams in rooms have aided in characterizing the types of flora prevailing at the time of occupation of the site. Again, average ring width from a certain site at a given time will tell much of water-supply conditions and cover. Sometimes a gradual stripping of the cover and lowering of the water table are well reflected in the slow dying of the trees, as indicated by the steady shrinking of the rings of all the trees collected at a site. Such an example is provided by Wupatki Pueblo, in the Little Colorado River valley.

It is, however, in the archaeological interpretation of a list of dates derived from a ruin that the most can be learned of its occupation, and care in the profuse and proper taking of field notes is most particularly appreciated. As is true with many other problems, good common sense is here of the utmost value. A typical group of dates as derived from the beams of one room in a cliff dwelling where fourteen excellent beams, all dated, have been preserved will illustrate this point. One date shows as

A.D. 1145, two as 1173, and eight as 1174, with one each at 1176, 1179, and 1182. If they are listed horizontally, with their number of occurrences above, they will look like this.

1	2	8	1	1	1
1145	1173	1174	1176	1179	1182

Although this is an ideally arranged situation it is nevertheless somewhat as may be expected in actual practice. Sometimes all beams in a room have been found to give the same date; in some rooms even more widely scattered dates than these are found.



A pithouse excavated by the Museum of Northern Arizona in the Flagstaff section. Charred beams have been cleaned and left in place in the south end of the structure. The entrance is shown in the upper left.

The date 1145 probably represents the reuse of a beam from an earlier structure, from which it has been robbed, as it occurs entirely alone. The two beams from 1173 may have been surplus left over for a year from other building activities in the ruin, or they may have been cut the year before and stored for later use or to wait for seasoning of the wood. The eight beams at 1174 represent the building date of the ruin, or at least the cutting date of the beams when the builder had the plans in mind, for it is possible, of course, that the beams were seasoned

for a year or two, after the Hopi method of today, before the building was constructed. The three following dates, because they stand alone, undoubtedly represent repairs made in the structure after it was built and during its occupation, the last date certainly coming near, that is within four or five years, of the time at which this room was finally abandoned. Had it been occupied much longer the time period recognized between these repairs indicates that others would have been made. Thus it may be estimated, with considerable accuracy, that this room was occupied from 1174 to a short time after 1182, probably no later than 1186 or 1187.

An additional example, this time taken from actual dating experience at Kiet Siel ruin, in the Tsegi Canyon, may be of value. The first group of dates is simply twenty dates as secured from the ruin, without any attempt at organization or interpretation. They range in time from A.D. 1116 to 1284, and although they tend to group numerically in the vicinity of 1274 they still tell little. In the first column is the specimen number and in the second the date of the piece.

F.	DATE	F.	DATE
3161	1116	3114	1274
3124	1154	3118	1274
3164	1258	3135	1274
3108	1262	3144	1274
3152	1269	3183	1274
3138	1275	3112	1274
3192	1274	3113	1275
3106	1273	3116	1275
3119	1274	3117	1275
3139	1273	3111	1284

If, however, the dates are listed by rooms, as encountered in the ruin, they become more significant.

ROOM	DATE
12	1116
14	1154 (These are from eleven shakes in the roof)
6	1273
7	1269, 1274, 1274
13	1274
Storage	1274, 1274
8	1274, 1274, 1275, 1275
3	1274, 1275
15	1275
Beams found loose in rubbish	1258, 1263, 1273, 1284

With the data so arranged little skill in interpretation is required, for now a map of the ruin may be drawn and the dates may be placed in the rooms so that the order of construction of the pueblo may be seen.

Even more may be gained by a notation of the location of the various dates in the room. If the main central horizontal supporting beam gives a date of 1174 it is certain that the room was not built before that year, for it could not have been replaced after it was supporting all the other beams. The same would be true of the four main vertical support posts of the roof in a pithouse which were found to date the same year. Certain features which were added subsequently to the building of the room may easily be determined, such as the addition or enlargement of a ventilator in a pithouse.

So far, by the process outlined above, only a building date has been arrived at, but archaeologists are interested in dating as much of the associated culture as possible. Any material found resting on the floor of a room, such as pottery, basketry, clothing, jewelry, and other artifacts, must of course be assigned to the time of the last date, or shortly following it, as these were the articles in use at the time of its abandonment. In the first room outlined above, the ten-year period of occupation would show no change in materials being used, but if the period were to be extended to two hundred years, as is indicated in the occupation of some of the pithouses in the Flagstaff area, radical changes would be expected. When a long period of occupation is indicated recourse must be made to the debris piles, where stratigraphic studies will indicate the changes of culture that took place. By an application of the seriation method an approximate dating of these changes may be accomplished.

In applying tree-ring dating to archaeology other possible confusing situations must be considered. First, it is not entirely impossible that extensive robbing of older structures might throw correlations of dates and culture far off. Assuming that the removal of all cover, including trees, had eventually led to the abandonment of a region, and that fifty or a hundred years later it was reoccupied, if no sizable trees were then at hand but many beams were still to be found in nearby ruins, it is entirely conceivable that these beams would be reused. This might give a very wide and haphazard distribution of dates and form an exceedingly confusing problem. Such a situation is somewhat indicated at Wupatki.

In the same way it is likely that because one site was chosen for occupation it would be chosen again by later people, who, seeing it occupied by a ruin with many beams and fine building stones, would merely clear

away the debris and utilize at least part of it in building their own homes. Or, again, part of the site might be allowed to fall into disuse, much like the Hopi towns of today, and later a house might be built on the site of a much older one, the beams and stones of the earlier structure being utilized.

Almost from the beginning of dating of archaeological sites through tree rings various individuals have raised the question of the possibility of the use of dead trees for beams, in preference to the cutting of live ones. This is exceedingly unlikely in the light of the tools the prehistoric Indians had at their disposal. Stone axes would be a poor implement



A charred post in location as found in a pithouse. It has been wrapped with string to prevent deterioration upon exposure.

with which to fell a dead tree, and at best a tree once dead could have lasted only a few years before it would have rotted beyond use. However, in the rare total absence of live trees, it must be admitted that they might have been used.

The dating of charcoal or wood fragments from trash heaps, to correlate with the stratigraphy found there, has been undertaken by several individuals. Because many of the pieces will be likely to be small brush or branches, and because they are often far from an actual original outside, true dates are very difficult to obtain. Where there is a sufficient

quantity of such material, as at the larger pueblo ruins, it can most profitably be utilized. Dr. Hawley, in her work on Chetro Ketl, employed this method to the fullest extent.

Little has been said thus far about the determining of actual outside or cutting dates, or more properly "bark dates." If the bark is still on the piece there is no doubt that it represents the actual cutting date. If the outside ring extends completely around the beam and is everywhere unbroken, it may generally be assumed to be a bark date. In many specimens it is possible to identify the outside by the peculiar surface which is to be found when the bark is removed. But where weathering has obviously removed some of the outside a great deal of experience is required to estimate the amount which has been lost. With charcoal an absolutely accurate guess is impossible, and any estimate within five years is usually somewhat questionable when the outside of the piece is badly and irregularly shattered.

All these situations, and more, are not only possible but frequently encountered in the application of dendrochronology to archaeology. Quantities of dates, and many correlations with cultural material, are needed before accurate dating may be done over the Southwest generally, but these many correlations are rapidly forthcoming. In all primitive structures in the Southwest beams were used extensively, and as they rotted in place, or broke under prolonged strain, they were replaced. In houses which were sheltered in caves the beams are often found in place, and those in the open which were destroyed with fire sometimes contain much charcoal. Both these sources have supplied huge quantities of material, much of which has been dated and much more of which will eventually be dated. However, the supply is limited, and great care should be exercised, not only in the collection of such specimens but also in their preservation.

The dating of specimens is by no means a simple process. It requires a great deal of actual experience before any degree of certainty may be acquired. At the present time all material dated by various workers is finally checked by Dr. Douglass, that by this double dating errors may be reduced.

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Chapter VI

POTTERY

The value of pottery was recognized early in Southwestern archaeological work, for during most of the major periods of Southwestern prehistory it was widely made and used. With more careful recent ceramic studies, and the division of general groups of pottery into explicitly prescribed types, it has become increasingly important. Intensive research on pottery has indicated that, because of the following points, it is the present most generally useful trait.

1. Pottery once made and fired is practically *indestructible*.
2. In any site (of pottery-bearing periods) which was inhabited for more than a few years it is relatively *abundant*.
3. It was made throughout the entire Southwest during most periods of cultural development and is therefore *widespread*.
4. It reflects minute *changes* (which may constitute definite types, or subtypes) both temporally and spacially.
5. It is relatively *easy* to *collect, handle, store, and study*.

For these reasons, pottery has become the most valuable diagnostic of culture change, the first step in reconstructing archaeological history. It is, also, certainly the most valuable trait in the application of the seriation method of cross dating, or in correlating individual sites or even total culture complexes.

I. POTTERY METHODS

The best introduction to a study of pottery and pottery techniques, since ancient methods of manufacture can be reconstructed from a study of finished products, is a review of methods employed by living potters in the same region. The Hopi Indians, surrounded on every side by the ruins of their ancestors, the Pueblo people, represent the best possible source of such information. It may be assumed that ancient pottery, which is identical to that of today, was produced by the same methods as those now in use. Even though not all prehistoric pottery is paralleled

by identical modern types, at least some ancient methods may be reconstructed by a careful study of modern ones.

Although plain or undecorated pottery is now made on all the three Hopi mesas and in most of the Hopi towns, those who produce the finest painted pottery live on the first or east mesa. Many of these people are actually a Rio Grande Pueblo group, who have lived so long in the company of the Hopis that they have assimilated many Hopi traits.

Quarries, centuries old, are the source of the clays from which the pottery is made. Three types are collected: a hard light gray clay, from which the body of the vessel is built; a finer white clay, which is often used as an outer coating or slip; and a yellow clay, which burns red, used as a slip or a paint. These types are carefully selected at the quarries and removed to the Pueblo, where they are prepared for use.

The first operation is to break up and then grind the hard dried clay chunks into a fine powder. This is accomplished on a metate, or grinding stone, with a mano, or hand stone. (See Fig. 34.) The clay is ground to a powder and sifted, usually by choosing a spot where a gentle breeze is blowing, perhaps a doorway, and dropping the powder from a height to a cloth spread on the floor below. The wind thus obligingly grades the material. Only the more finely ground is collected and stored in bags or baskets until it is to be used; the rest is reground and the process repeated.

When a sufficient quantity of clay is prepared it is placed in a vessel and water added until a rather sticky paste, of doughlike consistency, results. This is thoroughly mixed and kneaded to the exact plasticity required, then placed in a solid container and covered with a damp cloth, to be used as needed.

If a temper is required to keep the vessel from cracking during shrinking incidental to the drying process, rock ground in a metate, or sand collected from a wash, is added to and mixed with the powdered clay before moistening. In certain sections of the plateau, it was a prehistoric practice to grind up and add sherds (broken pieces of pottery) as a temper; in other regions such material as cinders, or in the desert sands containing mica, were used in the same manner.

For the actual construction of the vessel a quantity of clay sufficient to form the base is removed from the supply and placed in a basket or large sherd in front of the operator. This acts as a support upon which the work may subsequently be more easily turned for manipulation. With the hands, and accompanied by constant turning, the lump of clay is

modeled into the form of the base of the vessel to be made. This usually consists of a very shallow bowl-shaped or disk-shaped piece, which, when it dries slightly, may be removed from the support and placed directly on the ground.

A thin gourd or wood scraper is often brought into play to size down the thick walls, and somewhat smooth them, by scraping away excess

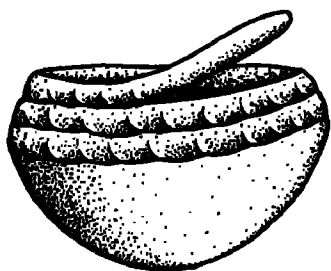


FIG. 14. Diagram illustrating the method of modeling pottery by coiling. The base has been scraped smooth, while the coils, roughly pinched down, show at the top with the end of the rope of clay free.

clay. Another mass of clay is removed from the supply and shaped into a thin rope, one-half inch or less in diameter. The end of the rope is pinched to one point on the rim of the base, where it adheres, and by progressive pinching is coiled spirally around the work upward to form a portion of the body of the vessel. This is known as the coiling and scraping process, and was widely used by potters in America.

The coils thus formed are allowed to dry slightly, when the scraper, usually dampened, is once more employed to thin down the sides and smooth the sur-

face. By scraping only the inside at this stage, and leaving the outside of the vessel with pinched or indented coils, a type of decoration known as corrugation is made. Should this not be desired, the coils are first smoothed out by hand on both surfaces, and the vessel walls then rubbed down with a fragment of sandstone to the required thinness.

After a short period of drying to harden the clay of the body of the vessel, another coating of very fine clay may be added as a slip or wash. This is mixed with water, to about the consistency of heavy cream, and applied to the scraped surface with a rag or daub. After it has dried slightly it is polished vigorously with a fine-grained smooth-surfaced pebble to give a more or less high polish to the surface.

What is often termed a pseudo-slip may be created by simply wetting the surface of the clay and polishing with a pebble, without adding additional fine clay. This acts essentially in the same manner, by drawing the finer particles of the clay to the surface as a "float," and often cannot be told from a very thin true slip. Another short period of drying follows before the pigments of the design are applied.

Design paints are usually prepared in advance at considerable ex-

penditure of effort, and stored until they will be used." The two most common pigments are derived from varying amounts of carbon and iron. The main source of carbon appears to be organic matter derived from plant juices. This, when fired, of course, carbonizes to a deep black. The iron is much more varied in results, for a slight trace of iron in clay will turn yellow or buff when fired in an oxidizing atmosphere, a higher content will be orange, and a considerable amount will fire red. As at least some traces of iron are to be found in almost all clays, only those which are pure kaolin, or are fired in a reducing atmosphere,* will remain white or gray. As a result various combinations of buff, yellow, red, orange, and black form by far the largest part of the color decorations on pottery. By a careful selection of the fine clay which forms the slip on the surface of a vessel, the uniform base color may be predetermined. The heavily pigmented surface slip appears to have been most typical of orange and red base colored vessels, and less so of the yellow and buff types.

Some iron is often present in carbon black paint (a more common characteristic of certain areas) as well as traces in the slip of black-on-white pottery which has been fired in a reducing atmosphere. If such vessels are by any chance refired in an oxidizing atmosphere the carbon will tend to burn out, leaving the originally black paint red, and turning the white slip buff, or occasionally even yellow. Only in the Mimbres types does it appear that pottery was sometimes deliberately fired in such a manner as to oxidize parts of a vessel and reduce the rest, or to oxidize or reduce all.

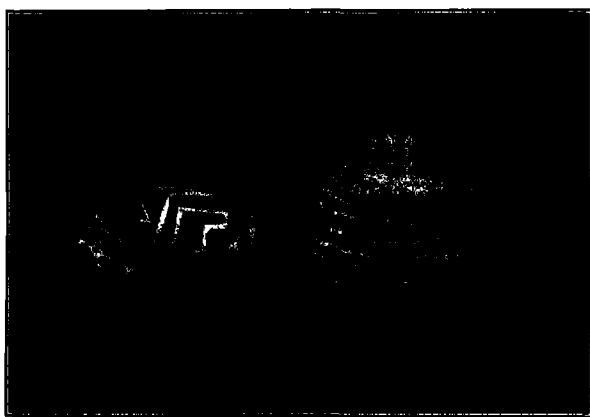
Not only were carbon, derived from organic material, and iron used as pigments in decoration, but several other metals in mineral form were also used. Manganese, lead, and copper were the most common of these. Manganese appears in certain black-on-red types in the Flagstaff area, and copper and lead as a glaze paint on types from the Zuni region.

Pigments are ground on a stone palette, where they are mixed with water to form a paste. They are applied directly to the surface of the vessel with a small fiber brush, apparently in predetermined patterns often of considerable complexity, with a surety of purpose which must be admired. Sections are first blocked out, and areas of solid pigment

* By reducing atmosphere is meant that the gases which reach the pottery during firing do not contain oxygen and, therefore, cannot oxidize any minerals in the paint. An oxidizing atmosphere is one which contains sufficient oxygen, such as normal air, to oxidize the minerals.

outlined before they are filled in. A second and even third coat may be applied if they are felt necessary.

After the vessel has been modeled to approximate shape, scraped to thickness and exact form, slipped, polished, and painted, it is put away in a shady spot to dry for several days. During drying any vessel shrinks considerably in size and, if it does not contain the proper kind and amount of tempering material, will often crack. Too rapid drying will also result in cracking, so that great care at this stage, as well as every other, must be exercised by the potter. At the time of firing the vessel must be completely dry, for any appreciable amount of water will cause steam to form internally, and sections to explode from the surface. For this reason, pottery is often given a slow drying near a fire just previous to its final baking.



Two examples of Roosevelt Black-on-white pottery from near Roosevelt Lake. The bowl is very characteristic and shows the use of balanced solid and hatched areas as well as the common stepped element.

Today the Hopis make use of dried blocks of sheep dung for fuel. The fire is started with wood, or other easily ignited material, and allowed to burn down to coals, manure is then piled about on this bed, and the pottery, carefully inverted, is stacked above it. Other chunks of fuel are then built up around, and finally over, the mound of pottery, being partly held in place by sheets of tin or large sherds. Much care must be exercised in piling pottery and in the distribution of fuel, so that pots are not touching each other on large enough areas to exclude

the oxygen, or that burning coals do not fall against the side of a vessel. The latter accident is a most common difficulty; it results in a reduced area surrounded by a carbon-black smudge, commonly referred to as a "smudge spot" or "fire cloud."

Although only one type of firing atmosphere is known and in general use today in Arizona, two appear to have been commonly employed prehistorically. Any atmosphere which contains even a small amount of oxygen during the firing process will be sufficient to produce oxidation of the iron pigments already described. This appears to have been by far the most widespread and common type of firing method throughout most of America, and certainly is the method typical of both the Hohokam and Mogollon people. However, in the plateau area, particularly among the earlier Pueblo people and the late Basket Makers, a reducing atmosphere was most commonly employed. The manner in which such an oxygen-free atmosphere may have been produced still remains somewhat of a mystery, for no vestige of what might have been considered a kiln has ever been discovered in the Southwest. Recent experimentation has indicated that a juniper-wood fire large enough to consume the oxygen in the vicinity of the vessel will produce such results, and it is felt that this may have been the method used. In certain sections of the plateau it is believed that some of the Pueblo people made use of coal in firing, and it is just possible that they placed live coals in pits dug into the ground, where small quantities of pottery were fired at a time while covered over with earth. By whatever method, it is certain that reduced pottery was made in the plateau and is typical of this section.

Unfortunately for the Indians, and perhaps fortunately for the archaeologist, a rather high percentage of loss attended pottery making. The manufacture of fine, thin, well-fired pottery is an extremely exacting process, for every step must be carefully carried out. The paste must be of the right type to fire well, it must be of the right consistency to model, if temper is needed it must be of the correct type to prevent cracking during the drying process, the vessels must be completely dried before firing, the paint permanent and well applied, and the firing so controlled as to prevent contact between vessels or with burning brands. Thus the art of pottery making is a highly skilled craft, and one may easily understand how an expert potter would be regarded with respect.

Prehistorically two distinct methods of pottery manufacture seem to have been in general use. In the plateau region it is possible that the earliest pottery was simply made by modeling the entire vessel from a

mass with the hands alone. Though there is no indication that any other method was employed, neither is there any absolute proof that only modeling was used. Later, coiling apparently was introduced or, perhaps, even discovered, so that the first vessels showing this technique were coiled on the necks alone. This was followed by coiling most of the body of the vessel and scraping to size, as already described. It is an interesting and significant observation that all the Pueblo people made pottery in this manner, so far as is now known, and did most of their firing, until about A.D. 1300, in a reducing atmosphere.

The Hohokam people also formed their vessels by the coiling process, very much in the manner of the Pueblo groups, though often using much larger ropes of clay for their coils, which were flattened down to form a greater area of the surface and body of the vessel. As the pot was formed it was further shaped and thinned by what is known as the paddle and anvil process. This required an anvil of stone or clay, which was held in one hand, and had a somewhat rounded upper surface, while a paddle, apparently of wood, was held in the other hand. The anvil was placed against the inside of the vessel, and the paddle was scraped over the outer surface, thereby thinning the clay of the wall to the desired thickness. This method may often be recognized in sherds by the

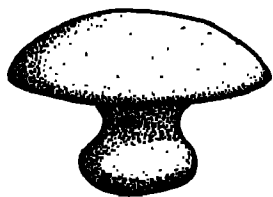


FIG. 15. Pottery anvil. These objects are of varying sizes and shapes, and are made of several materials including stone and pottery.

presence of shallow anvil marks on the inside, particularly on those of large vessels which came from parts of the pot below the rim, for example, where they could not have been readily seen.

The Mogollon people apparently made use of the coiling and scraping method, possibly in some of their earliest types not scraping the outer surface but merely roughly rubbing it down. As a result the basic methods of pottery manufacture are of some aid in determining broad cultures in Arizona, and particularly in tracing influences from one of these groups to groups in other sections. In this manner it is possible to demonstrate Hohokam influence in the Flagstaff area, where some pottery types are made by the paddle and anvil method, although the coiling and scraping technique was also used.

II. TECHNICAL APPLICATION

In any ceramic effort in which individual pots are not produced in molds, and designs are not stamped or applied by transfer, individual

variation is theoretically almost unlimited. Were it not for styles and modes, or vogues, no two pots, beyond the fact that they were containers, might be expected to be even similar. However, in examining large collections of pottery, although no two are identical, many are similar in general form, color combinations, and even broad design patterns.

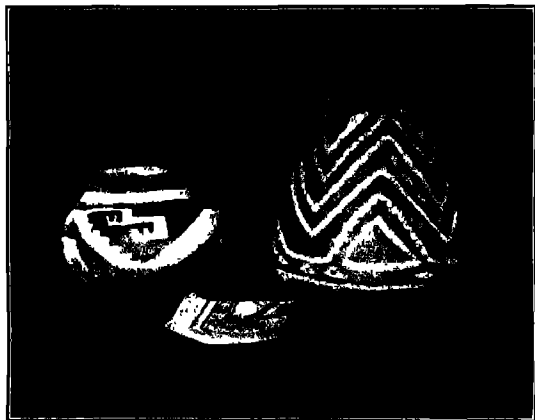
There is a certain parallelism between pottery and human beings. Each individual is different, and is recognizable by minute characteristics of facial features, movement, stance, or voice. Sometimes because of outstanding combinations of these features an individual may be identified as a member of some particular family. The larger groups, such as nationalities or races, are quite easily recognized. The same is true of pottery, for although a rare piece may defy identification most may readily be placed in their proper broad classification.

Before any very detailed study may be made of prehistoric pottery the various kinds must be divided into their proper categories and appropriately labeled. This means that they must be classified and named according to some scheme. At a conference held at Gila Pueblo in 1930 it was agreed by attending archaeologists that a standard form of naming would thereafter be followed in referring to newly determined pottery types. This name is made up of two parts, the first some geographic term, where the type has been found, followed by a descriptive name. For example, Deadmans Black-on-white means that the type has been found in the Deadmans region near Flagstaff, and that it is black-on-white pottery. The various descriptive terms which were suggested at Gila Pueblo were: Black-on-white, Black-on-red, Brown-on-yellow (now Black-on-yellow), Red-on-buff, Polychrome, Corrugated (both indented and plain), Incised, Slipped Plain, and Unslipped Plain. These classes will still more or less identify most of the types known.

Although the term "type" is very loosely used in regard to pottery, a definite concept will be implied in this book from now on. A *type* is the smallest useful division of pottery which may be isolated and identified. The Museum of Northern Arizona has placed the further restriction on it that it must be of value in determining time or areal factors, or preferably both. This, then, is the unit in the system of classifying pottery, below which no further division is possible, although at any time other types may be isolated from within one original type. The largest division is a *ware*, which is a group of pottery types showing a majority of individual characters in common. This larger grouping has been introduced simply because it is an aid in dealing with obviously related types.

A third term, "series," is also sometimes found useful by the Museum of Northern Arizona staff. This implies that a number of types not only are related but that they are actually genetically related. By genetically related it is meant, of course, that one developed from another, so that a time series has been produced. Thus one may speak of Tusayan Gray Ware, a part of which is the Tsegi Series, which is made up of Lino Gray, Lino Black-on-gray, Kana-a Gray, and several other types.

It has been suggested that a type is the smallest division that is possible, so long as it is a useful division. It is obvious to anyone who has made much study of ceramics that it is possible to subdivide pottery almost indefinitely, if individual sherds, or even vessels, are examined minutely and compared by the most extremely fine distinctions. From



Gila Polychrome types of pottery found in a burial in the Roosevelt area. These are one of the best indications of Salado Culture.

this it is apparent that the problem which confronts the working archaeologist is at just what point he will stop his study. At the present time it appears that a microscopic examination of masses of sherds is impossible and, in fact, does not yield a very great return to problems of the types that are now being investigated. For this reason, a macroscopic examination is what is most commonly relied upon, particularly for field and laboratory studies, where thousands of sherds are being examined and classified. The only mechanical aid normally employed is a relatively low-power hand lens, which is of use in identifying temper.

The following criteria have been found to be most useful in establish-

ing types. (1) The method of construction, whether coiled*and scraped, or paddle and anvil. (2) Color of the clay in the body of the vessel. (3) The material, shape, and abundance of temper. (4) The nature of the fracture of the sherd, and its relative hardness. (5) The surface finish, such as polished, scraped, bumpy, or corrugated or otherwise altered. (6) The surface color and decoration. (7) When possible, distinctive characteristics of shape, or painted or other decoration. All this must be tempered by much actual experience and good sense, for here, as elsewhere, it is extremely easy to become so involved with the trees that one loses sight of the forest.

After handling great quantities of sherds, it is usually a simple matter for the individual worker to separate them, but it is an entirely different matter when an attempt is made to list these distinctions so that others may apply them with equal facility. Even the best of the most standardized descriptions are sometimes misleading, and for that reason it has been found generally advisable to build a sherd library of actual specimens, much like a study collection of fossils, for the aid of the student. Some time spent handling these collections will generally be of more permanent value than any amount of reading.

Early in this chapter the reasons why pottery is the best indicator of culture change were discussed; they may again be referred to as the reasons why pottery classification is desirable. Without definite classification, types cannot be isolated and readily referred to in later work. Once types are defined, time relations and geographic distributions may be worked out for them, and they become one of the archaeologists most useful aides. It will be recalled that archaeology has been defined as the making of history from prehistory, and that the archaeologist is interested in the relationships of various events in their proper time and space context. Thus one of the basic problems of archaeology is tracing the origin and spread of traits. Pottery is certainly the best indicator of such relationships.

One of the most interesting problems is that of prehistoric trade. Studies undertaken at the Museum of Northern Arizona indicate that pottery of certain types was made in restricted areas and at definite times.

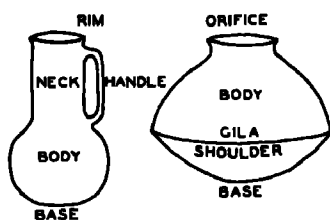


FIG. 16. Diagram of two vessels with various parts labeled for identification. See list of terms in glossary.

It is now becoming increasingly apparent that the actual point of manufacture of certain types may be much less widespread than was originally thought, it being possible that only a few families, or perhaps villages, made most, or all, of certain pottery types and traded them to surrounding areas.

Two types of pottery always have been commonly manufactured. One, a crude culinary or kitchen type, has been widely made by every people. These are the cook and storage pots of everyday use, usually of relatively large size, and seldom decorated. The other class is the table or ornamental type, almost invariably smaller, expertly finished, and usually highly ornamented. The culinary type was probably made locally by the people who used it, for large heavy vessels would have been difficult to transport over great distances. The finer vessels, because of their beauty and expert workmanship, as well as their usually smaller size, could be, and were, more widely traded. Because of this, trade relationships in ceramic studies are most profitably based on the decorated types, while information regarding human relationships may best be based on the study of culinary types. There has been a tendency to neglect this latter group, probably because of the relative ease of identification of the former. However, it is from the undecorated types that the most exact and vital information may be expected to come eventually.

There has apparently been a general misconception of the relative abundance of the decorated and undecorated pottery in the Southwest, particularly that from the earlier periods. Careful data taken from thirty-three sites in northern Arizona, mostly belonging to Pueblo II culture stage and based on a great many sherds, show that the average amount of decorated pottery is only seven per cent of the total in each site. This is a surprisingly small figure, but of the thirty-three sites only four had twenty or more per cent decorated. The large trash mound at Winona Village, just east of Flagstaff, which contained thousands of sherds, produced only thirteen per cent of decorated types, while Tuzigoot Pueblo, a Pueblo IV site in the Verde Valley, contained only six per cent.

If detailed study, such as chemical composition of paste or identification of minerals in the temper, is made, it might most profitably be directed more generally to the undecorated types. Such microscopic studies, although exceedingly difficult and slow to make, are, of course, of extreme value in indicating directions of trade. An examination of the early sherds from Snaketown Village, in the Middle Gila, showed that many of these sherds were made of the same material as those from

the upper waters of this drainage area, thereby linking the early settlers in this area with the Mogollon Culture to the east. This is the sort of information it is desirable to obtain as a definite step in historical reconstruction.

Much in the same manner, relative percentages of decorated and undecorated pottery from individual sites, once plotted, will indicate areas where certain types have been manufactured and the extent over which they have been traded. Such detailed studies have not been attempted as yet, for this type of information is probably not quite sufficiently complete to be conclusive. Without definite types none of this work could be accomplished.

Pottery is also the best known culture-trait indicator of time, for obviously constant experimentation was going forward in this medium. Designs, forms, and color combinations progressed rapidly, and taken as a whole they are relatively fine time division indicators, once they have been dated. The most accurately dated pottery is that derived from the plateau area, for it is here that the most abundant and readily dated beams are found. As the dating of sites, and so the dating of artifacts, has been discussed in a previous chapter, no attempt to review this matter will be undertaken here. In passing it might profitably be stated once more that the dating of even such abundant material as pottery from tree-ring dates is no simple matter, so that with few exceptions such dates must be considered little more than general indications of the period when the type was made and in use.

The list of dated pottery types in Appendix II will be found most useful in later references.

Once pottery has been definitely named, dated, and placed as to region normally occupied, much use may be made of it. Reference has already been made to the information which may be gained from it as regards

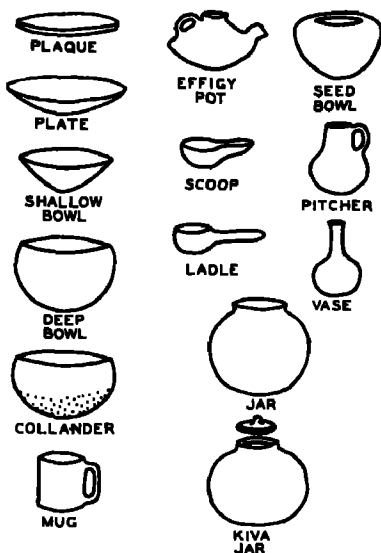


FIG. 17. Diagram of various pottery shapes. Terms will be found to vary with different individual writers so that these may be taken only as an indication of form names.

trade relations and culture associations. It is also possible, through cross finds of dated and traded pottery types, to assign at least approximate dates to sites which contain no datable beams. Much of the culture of the desert has been so dated, on the basis of trade pieces from the plateau. Not only is such dating useful over broad areas and between distinct cultures, but it is equally of value to dating in areas where dates are often found but individual sites do not happen to have datable material. This enables the archaeologist to fill in the gaps in his detailed time, geographic, and population studies more accurately, a phase of archaeology which is of the utmost importance.

Larger classes of pottery, such as wares, are usually indicative of broader cultures. In a general way pottery containing mica temper is almost invariably derived from the desert area; that with sand, quite likely from the San Juan or Little Colorado area, while crushed or prepared rock or sherd temper is most commonly found to be from the eastern San Juan or eastern Little Colorado section. Similar divisions may be made on the basis of the types of paints used or the methods of manufacture of the vessel.

In general it may be said that the Hohokam people made their pottery by the paddle and anvil method, that most of it contains mica or micaceous material, and that it was fired in an oxidizing atmosphere, and so is red-on-buff, buff, or tan. By comparison the Pueblo people made their pottery by the coiling and scraping process, tempered with sand, crushed rocks, ground sherds, or similar material, and fired largely in a reducing atmosphere, to produce a gray or white pottery. The Mogollon people built their pottery by coiling and rubbing down the surface, occasionally leaving a somewhat irregular surface finish, tempered largely with crushed rock, and fired in an oxidizing atmosphere, to produce a red and brown pottery.

Any study of Southwestern ceramics will be found filled with new and confusing terms. For this reason Appendix III, a brief glossary of ceramic terms in common use, has been prepared.

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Part II
Description of Cultures

Chapter VII

ANCIENT STAGE 8000 B.C.

An introduction to the archaeological history of any American group should certainly be prefaced with a discussion of the theories of the origin of the Indian. To do justice to this subject it would be necessary to write a paper the dimensions of this entire book, but as the primary interest of this volume is Southwestern archaeology alone only a few of the most favorably considered theories will be mentioned.

To date no palaeontological evidence has come to light in America indicating the presence of any mammal forms, ancient or modern, which closely resemble man. Several of the Old World apes are structurally similar enough to man so that in any biological classification they are placed close to him, but these animals are of a type having a relatively narrow nose. All the monkeys known to be native to America are of the broad-nosed type, and for this reason, and because of other, similar structural characteristics, they are not felt to be close to the general stock to which man belongs. Because of this the Old World has long been considered the probable home of the human race, and any inquiry into the origin of the American Indian is most concerned with the possible means by which man reached America, and at approximately what date.

Four routes have been open to human crossing from the Old to the New World in past time. Man might have come directly across the South Atlantic from Africa to South America, for it is here, across this ocean, that the two continents are closest together. This would have required boats of sufficient seaworthiness to have weathered a lengthy crossing, and as we now understand European prehistory such boats were not known at a very early date. The second possible route is directly across the South Pacific, but here again what information is available is directly opposed to any very early crossing. Although there are an abundance of islands dotting the Pacific Ocean the eastern islands do not appear to have been occupied in great antiquity, probably not before the time of Christ. Boats necessarily had to be developed before a complete crossing could have been effected, and again this would place the

date far too late for the original peopling of America. The third possible route is across the north Atlantic, from northwestern Europe through Iceland, Greenland, and to our own northeast coast. The open water passages by this route are relatively short, but still great enough so that substantial ships would have been required before a passage could have been made. The likelihood of travel across the ice during one of the glacial periods may probably be discounted, because of the difficulty of providing food for such a long trip. The fourth possibility is by far the most probable and the one which is enjoying the greatest popularity at the moment. This is a crossing from Asia to America through Bering Strait. At the present time this strait is so narrow that in proper atmospheric conditions it is possible to see land from either side, and geological evidence indicates that in prehistoric time it may have been much narrower. Under such conditions it would have been simple to cross on the ice from one continent to another, and to have made the passage before boats of any sort were invented.

The various possible routes are thus: (1) Across the south Atlantic; (2) across the South Pacific; (3) through Iceland and Greenland; (4) across Bering Strait.

Physically the American Indian is very closely related to the general Mongoloid type, thereby strengthening the theory of the Bering Strait route. However, careful studies have indicated that the historic eastern Indian shows more Caucasoid or white characters, lightly overlying the abundant Mongoloid, and that there is a slight trace of Negroid, or perhaps Australoid, in some of the modern Indians of South America. From this it is possible to postulate a relatively early migration of small numbers of Mongoloids from Asia to America, which overshadowed former people and formed the main strain of the American Indian, followed by later, still smaller, groups of Caucasoids from the east, and Negroids in the south. The very strong Mongoloid characters in the west would suggest continued Asiatic movements into America at later dates, to strengthen further the already present Mongoloid elements.

If the Bering Strait passage is accepted as the earliest route into America, the next question of interest is how humans eventually reached the Southwest. The most-favored route is one through the northern, and non-mountainous, portion of Alaska, which turned south on the eastern slopes of the Rocky Mountains, one branch working southeastward into the Mississippi valley, another going through the western high plains into Mexico, and thence into South America. It was a group of this latter

ranch which is believed to have swung further west through lower country into the Southwest. A direct passage from Alaska down our west coast is felt to be highly improbable, for the present rugged nature of the country would have made such a route in early prehistoric times nearly, if not wholly, impossible.

The time at which man might have entered America appears to be still more doubtful. Archaeological history is very much like a long series of preserved periodicals which have been constantly in use. The earliest volumes are tattered and worn, portions lost, and others faded to the point where they are almost unreadable. The later chapters are more complete, the story clear, and more easily read, and these volumes lie at the top of the pile where they may most easily be gotten at. Too, people who chose one location as the site of their homes will be followed by others who will choose the same location for the same reasons, obliterating or scattering the remains of the earlier residents.

It is for these reasons that the earliest chapters of archaeological history are difficult to determine with certainty, so that theory or possibilities must be relied upon until sufficient data make more accurate conclusions possible. Geologically it appears that a passage to America and a route down the east side of the Rocky Mountains may have been open during the last interglacial period. This is what is commonly known in the upper Mississippi valley as the Sangamon, and has been approximately dated as some seventy thousand years ago. The next most likely period is the immediately post-glacial, when the icesheets were retreating northward and the same route would have been open. This time has been suggested as some twenty or, at the most, thirty thousand years ago.

Until recently, it has been assumed that the presence of extinct animal remains was an indication of glacial times. It is now felt, by at least some individuals, that these creatures might well have survived into post-glacial periods, and that human finds associated with such animals cannot be taken as proof of the glacial existence of man. However, it would

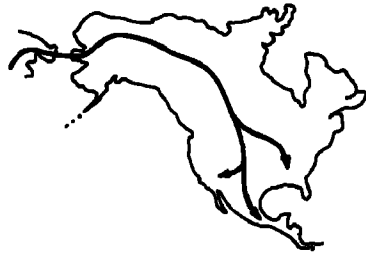


FIG. 18. Map illustrating the most commonly accepted idea of the route of migration of early man from Asia across Bering Strait into America. The main route probably was east of the Rocky Mountains, a branch entering the Southwest from the east.

still seem that they indicate some antiquity, certainly several thousand years, and so are of some use in dating.

What may prove to be the earliest evidence of man in the Southwest comes from Texas, where exceedingly crude chipped stones, the Durst eoliths, so named because they occur in the Durst silts, have been found. These silts have been tentatively dated by M. M. Leighton as belonging to the Sangamon interglacial period, and a time of some seventy thousand years ago suggested for them. If these are man-made tools, and if

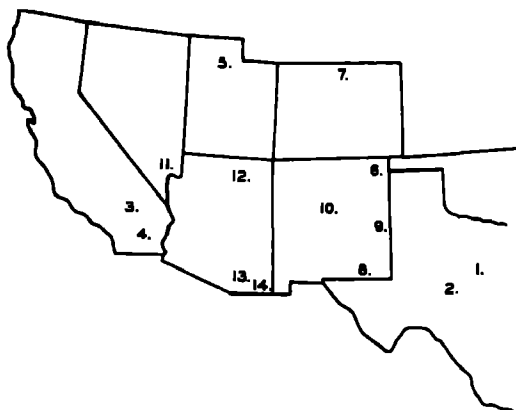


FIG. 19. Map locating the various early sites referred to in the text. 1. Abilene and Brazos River Culture. 2. Edwards Plateau Culture. 3. Lake Mohave Culture. 4. Pinto Basin Culture. 5. Old Lake Bonneville. 6. Folsom quarry. 7. The Lindenmeier site near Fort Collins. 8. Burnet Cave. 9. Clovis. 10. Sandia Cave. 11. Gypsum Cave. 12. Little Colorado River Terrace People. 13. Cienega Wash, on the Empire Ranch. 14. Sulphur Springs Valley.

these associations and this date be true, then a very early man existed in America. Further work is certainly called for on this problem. Unfortunately no skeletal remains have been found in these deposits with the Durst artifacts.

What may be the next earliest culture, also, comes from the same general area. This is the Abilene Culture of central Texas, which has been dated as more or less contemporaneous with the Wisconsin ice retreat, some twenty thousand years ago. It appears to be one of the earliest, or perhaps the earliest, of the thus far recognized cultures that has a definite projectile point. It is a long, slender, roughly flaked point of such distinctive character that it might well be known as the Abilene

type.* Associated with the Abilene point is a roughly chipped stone scraper. No grinding tools have been found with this culture.

Following the Abilene Culture in this same general region, but at a relatively later date, is the Edwards Plateau Culture, which has been divided into several phases. The projectile points are better chipped and finished than the earlier types, and they are found associated with scrapers and also with oval grinding stones and manos. These latter are not necessarily an indication that agricultural products were grown and ground, for it is more likely that they were used for grinding wild seeds and, perhaps, nuts or roots and bulbs. As these finds are not directly within the Southwest area, and as they are not now felt to have influenced the earlier cultures there, no further characterization of them will be attempted.

A great many apparent associations of man-made artifacts with the bones of now extinct animals have been noted and reported in America for several years. These were scattered throughout the entire southern half of the United States, the earliest reports appearing about the middle of the past century. The reluctance of several American anthropologists to accept

these finds, because of a preconceived idea of the relatively late arrival of the American Indian, for several years has been a strongly deterrent factor in dating early man in America. This attitude was successfully replaced by the present prevailing one only when convincing information reached proportions which could no longer be ignored.† Several of the finds which will now be discussed were the final factors in determining the acceptance of early man on this continent.

Apparently about contemporaneous with, or slightly earlier than, the Edwards Plateau Culture in Texas, what is now known as the Lake

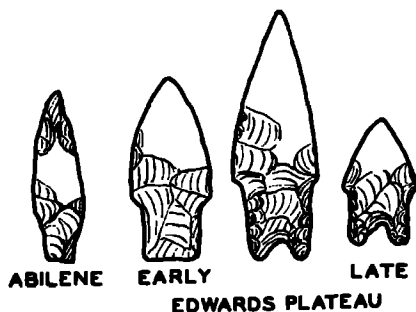


FIG. 20. Outline diagram of various types of early points from Texas. The sketched-in flakes are intended only as an indication to aid comparison of flaking techniques.

* For location of these cultures see accompanying map, and for shapes and relative coarseness of chipping see diagrams of point types.

† For additional data on this problem consult the references listed at the end of this chapter.

Mohave Culture was flourishing in southern California. Here artifacts and campsites were found scattered about the old beaches, most abundantly at those levels which were near, or slightly above, the highest point reached by the lake. As no evidences of human occupation have come from the playa of the lake bed itself, this culture may be safely dated as belonging to that time when the lake was at about its fullest. Antevs has placed this as a wet period at the end of the Pleistocene, probably about fifteen thousand years ago. The outlet of the basin in which the lake lay is now cut through eleven feet of solid granite, and it is assumed that the human occupation was definitely before this channel had cut to its present depth. No metates have been found associated with this culture, although what are termed hammer stones, with more or less flat sides, might also have been used as rubbing stones. Other



FIG. 21. Diagram of projectile-point types from California and southern Nevada. These are all obviously dart points and not arrow points.

chipped artifacts are choppers, scrapers (some keeled), round scrapers, end and side scrapers, flake knives, graters, and drills. Probably the most distinctive implements are rather broad projectile points which have been identified and divided into two obviously related groups, the Lake Mohave and the Silver Lake types. Some Yuma and Folsomlike points have also been found here, thus tying this culture, at least in approximate time, with that of the Folsom sites in eastern New Mexico and northern Colorado.

Probably somewhat later than the Lake Mohave Culture in southern California is the Pinto Basin Culture. This was found to be centered along the Pinto River, a stream which was apparently flowing during the same damp climate or "Pluvial" period. This would give it a probable date somewhere between ten and fifteen thousand years ago.

The campsites are located on the river terrace, all at about the same level, and extending for some six miles along the now dry stream. Fossil bones of both camel and horse come from this area, but to date no direct association of human artifacts has been found with these animal remains. All these sites represent a culture which is definitely pre-pottery and pre-arrow point, although they contain many distinctive dart points. (This distinction will be more clearly drawn in a later chapter.) The hearth stones at these sites do not show any traces of charcoal or carbon about or on them, which indicates a long period of exposure to weathering. Metates, and oval manos (or grinding stones), have been found at these sites, but all have been badly weathered, sometimes until they may be only approximately identified.

Probably the first truly convincing find of the definite association of human artifacts and extinct animals was that made near Folsom, New Mexico. Here several very characteristic flint points were uncovered in a quarry accompanying the bones of an extinct form of Pleistocene bison. These flints were subsequently named "Folsom points," and this name has followed them wherever they have been found. Eighteen Folsom points, many of them broken, were found at this quarry, and their relatively great number, and the fact that the tail bones of most of the bison were missing, led to the supposition that the animals had been slaughtered when they came down to drink at a water hole, and their hides, with the tails attached, removed complete.

The general interest which excavations at the original Folsom quarry aroused led Roberts to do several seasons' work at the Lindenmeier site near Fort Collins, Colorado. This site originally occupied an old valley bottom which contained bogs, springs, and marshes. These are believed to have attracted the same sort of extinct bison which were found at

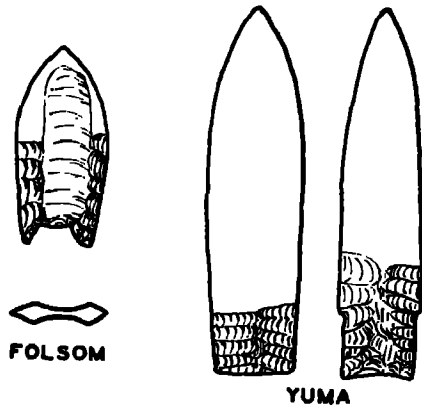
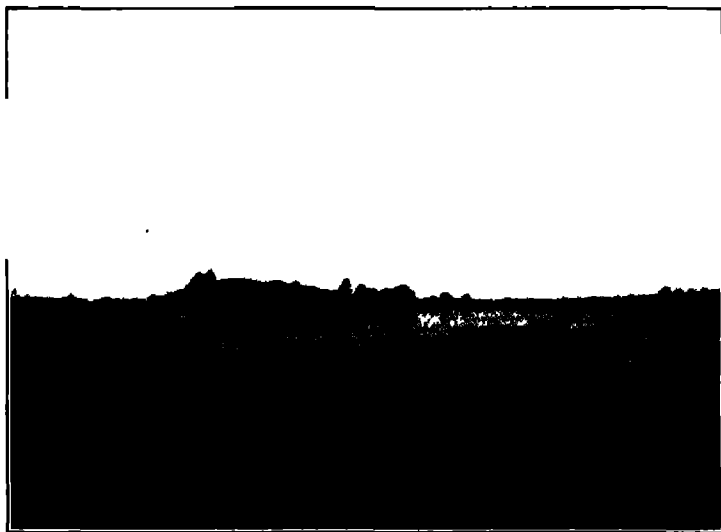


FIG. 22 Diagrammatic illustration of typical Folsom and Yuma points. The flaking on both types is remarkably fine and regular, but some of the Yuma types are exceptional, the flakes being very even and suggesting European Solutrean in excellence.

Folsom, as well as similar hunters. The large scattered campsite is now overlaid with accumulations of dirt up to seventeen feet in depth, so that considerable labor is required to clear the area down to the original occupation level. No habitations have been found, although surface fires, split bones, hammer stones, the debris from chipping implements, and implements themselves are found in some abundance. The points are of the typical Folsom fluted type. Besides these, snub-nosed scrapers, side scrapers, end scrapers, a variety of cutting edges, rough flake knives, large blades, drills, graters, sandstone rubbing stones, and a few bone tools, which probably are punches or awls, have been found. The stone industry is primarily flake, rarely being made from cores. Associated



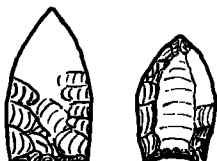
In many places throughout the Southwest temporary or more or less permanent shallow lakes such as this are found. Possibly in prehistoric time they were even more abundant than at present. At any rate they attracted animals, waterfowl, and even humans.

with these artifacts are the bones of extinct bison and camel. From this fact, and from the nature of the deposition and fill of the old valley, the age has been estimated to be about the close of the Pleistocene, or perhaps slightly later. Possibly a date of about ten thousand years B.C. would be a fairly good estimate. The Lindenmeier site is a second definite example of association of Folsom points and extinct animals from this section.

Several other sites showing almost equally convincing evidence have been found in New Mexico. Howard, working in Burnet Cave, west of Carlsbad, uncovered some striking information. Within the fill in this cave he found bones and other material to a depth of about nine feet, with fire hearths, obviously human made, to a depth of five feet eight inches. Within only the upper three feet were several cremated human burials, which had been placed in baskets or bags before they were buried. A careful analysis of these remains indicated that they were of the general Basket Maker type, and nothing about them suggested antiquity comparable to the lower material. Bones, scattered throughout the fill, represent an extinct four-horned antelope, bison, California condor, horse, deer, sandhill crane, woodchuck, mountain sheep, camel, prairie falcon, and a musk-ox-like creature. Charcoal and ash layers occurred throughout the fill to a depth of over eight and a half feet, and in some places contained burned animal bones. At more than five feet a Folsomlike fluted point was found under a large stone. This was associated with bison and musk-ox bones, and charcoal. From this it may definitely be assumed that the climate, at the time humans were building fires and using Folsomlike points there, was considerably cooler than that of the present.

Near Clovis, New Mexico, Howard located another site, this time in the open, which gave almost as convincing evidence. Old lakes or a river bed seems originally to have covered the area, thus representing a time when the climate was much damper than now. A stratigraphic series of beds were worked out, the top most layer of which (exclusive of the brownish top soil where present) was composed of blue or gray clay or sand. A careful examination of these blue clays and sands showed the presence of 89 species of diatoms, which, when they were analyzed and identified, proved to be of late Pleistocene or early Recent date. Invertebrates (shells), from the blue sands of the old lake beds, differed from those of this section at present, and also suggested Pleistocene (glacial) age. Several hearths were found in this bed, and the charcoal identified from them proved to be types of trees now growing in a climate similar to that of the mountains of Arizona and New Mexico today. Throughout this layer were the remains of extinct bison, and in the upper portion those of mammoths. Horse and camel bones came from the next layer down, one which Howard has termed the caliche or speckled sand layer. Artifacts consisting of both new types, and Folsom, or Folsomlike, and Yuma points, were found weathering out of and in position in the blue clay material.

Perhaps at this time it would be advisable to describe the Folsom and Yuma points more carefully. The Folsom point is of such a characteristic form that once seen it can never be mistaken. On each side a large shallow flake has been struck from the base toward the point, so that in



CLOVIS

FIG. 23. Types of points, other than Folsom and Yuma, found at Clovis, New Mexico.

section it appears to be biconcave. Careful secondary chipping has shaped the edge to quite exact outline, in fact all processes connected with this point have been surprisingly well controlled. Two horns, usually well marked, are found at the corners of the base, and the greatest width of the point is commonly forward of the center. (See diagrams.)

The Yuma type of point, which has several times been reported in association with the Folsom type, is much longer, more slender, and if possible even more carefully flaked. These beautifully made symmetrical points are strongly reminiscent of the Solutrean from western Europe. The flaking is usually very well executed and uniform.

Both these types have been found to be very widespread geographically, although apparently many of them are not identical to the originals, but only similar to them, often with poorer workmanship. Folsom and Folsomlike points have been found extending from the Rocky Mountains east as far as the east coast, though their main range and center seem to be essentially the high plains area, with a second less abundant occurrence in the Mississippi valley. The Yuma points appear to be more typically western, being found in numbers west of the Rockies, although Yumalike points occur sporadically from coast to coast.

In Sandia Cave, also in New Mexico, Hibben found two carefully chipped points sealed within or below a layer of very resistant and highly consolidated calcium crust. The second of these, a complete point, was found at the edge of a fireplace, which had been outlined with rocks. The now extinct animals, also sealed below this layer, were horse, sloth, and others.

Conkling Cave, near El Paso, which was dug by a Los Angeles Museum expedition in 1930, also contained a sealed sandstone layer within the natural deposits of the cave. Below this layer were the bones of camel, horse, ground sloth, antelope, wolf, condor, and associated with them a human skull fragment. Above this consolidated layer were bone fragments of sloth, horse, camel, bear, and human.

Thus, from New Mexico comes a series of sites which have most successfully demonstrated the contemporaneity of extinct animals and humans. All these finds are apparently more or less directly related to the Folsom Culture, but particularly the original Folsom site, the Lindenmeier site in Colorado, and the Clovis site. In Texas, Gila Pueblo has isolated another culture, the Brazos River, which is felt to be related to the Folsom and probably grew out of it. The type of point is certainly very suggestive of the Folsom point.

In the southern tip of Nevada, Harrington excavated Gypsum Cave, to find probably the second well-authenticated case of early man in the Southwest. Some rather mixed, but convincing, stratigraphy was worked out here. In the uppermost layer he found denim overalls, and evidences of Paiute occupation. In the second, Pueblo Culture, consisting of pottery, corn, beans, and cotton. In the third, Basket Maker Culture, with the characteristic atlatl and atlatl darts. The fourth consisted of a layer containing only mountain sheep dung and remains. Below that he found two layers of sloth dung, and below these, or eight feet from the surface, two fireplaces which were unquestionably built by human hands. This places the age of the fire builders at least as early as, if not earlier than, the sloth inhabitants of the cave, and the sloth is now an extinct mammal.

In dating such human finds the question of the age of the animal remains is, of course, of the most importance. Two possibilities may be considered: first, that the humans are of considerable antiquity, because of their association with now extinct animals; or, second, that the human remains are not so ancient, but that the animals have survived much later than was formerly supposed. Until very recently it has generally been assumed that such creatures as the mammoth, horse, camel, sloth, and certain species of bison, that had been surviving through at least the latter part of the glacial period, became extinct with the changing conditions attendant upon the ice retreat, and did not survive appreciably into the Recent geologic period. The many finds of these creatures associated with human artifacts has caused the palaeontologist to revise his estimates of the time of survival of at least some forms. His argument has often been that because they have been found of equal age with man they could not be so ancient as formerly believed. This is something in the nature of a vicious circle, in which the anthropologist claims antiquity, and the geologist more recent periods, on evidence which is actually the province of the other.

Obviously neither of these attitudes alone will result in very accurate dating of such finds. As a result it is with considerable relief that one

may turn to studies of ancient climate and deposition periods to check dates. Such work as that undertaken by Antevs, where he correlates by seriation human material, mammalian remains, and depositional and climatic studies, will certainly give the most accurate dating. It is largely from his work that relatively accurate dates may be assigned to the finds which have been made. Antevs states that the Pluvial period culminated in New Mexico about fifteen thousand years ago, that the mountain glaciation climaxed about twenty-five thousand years ago, and that



The remains of a Pleistocene bison found by the Arizona State Museum in the side of a wash in southeastern Arizona. Such finds may be roughly correlated with the Cochise Culture.

modern conditions have prevailed for perhaps ten thousand years. On this basis he dates the Clovis, New Mexico, finds made by Howard as between about twelve and thirteen thousand years old. In a more recent paper, read at the A.A.A.S. meetings at Flagstaff, April, 1936, he placed the age of the Cochise Culture (to be discussed), as prior to 10,000 B.C., again stating that a rise in temperature and decreasing rainfall took place about 13,000 to 10,000 B.C. in southern Arizona. Here are dates which are based on more than one criterion and so are of greater value.

Another observation, which is of this general nature, has been made

in northern Utah. On the highest terraces of Old Lake Bonneville, the prehistoric Salt Lake, remains of what appears to have been a charcoal fire were found in a cave. This cave is some nine hundred feet higher than the present lake, and as sterile layers of sand cover the burnt stratum it is believed that fires were kindled here when the lake was at this high level. If this is so, man must have been living in Utah at a time immediately after the end of the last glacial period.

A series of finds on all sides of Arizona have now been listed (except to the south, in Mexico) which give every indication of human occupation of the Southwest by at least 8000 B.C. The abundance of the finds surrounding this state would suggest that many evidences of early man might be expected here, so that it is disappointing that only three may be noted. The first of these is a situation quite comparable to the Pinto Basin, for, on hills eroded from the gravel terraces bordering the Little Colorado River from about Cameron to the vicinity of Holbrook, a series of prehistoric campsites has been located by the Museum of Northern Arizona. No habitations were found, but possible hearths have been located, and several hundred stone artifacts have been collected. The sites are always at about the same altitude above the present river bed, among gravels which contain workable flints in the form of water-washed boulders. Part of the industry is core, but chips were also utilized. The forms include hand axes, choppers, cutting edges, scrapers (some keel shaped), gouges, and about the same list as noted from other early campsites in the Southwest. To date no points have been found which could be definitely associated with the other implements, for they are all of types made at much later times in the same area. All the artifacts have been picked up from the surface of the terraces, none embedded in them, as are the bones of extinct animals. Although the artifacts are all of a rather primitive type, there is no proof that they are of the same age as the bones, and thus they cannot be accepted as absolute proof of the presence of ancient man here.

In 1926 and 1927 Dr. Cummings made two discoveries that are of the utmost interest. The first of these was found in the Cienega Wash on the Empire Ranch, not far from Sonoita, Arizona. He uncovered two human skeletons which were embedded in the side of a wash. Both of these were obviously burials, for they were fully extended and placed approximately in a line. Unfortunately they were not accompanied with any burial offerings, which would serve as an aid to dating, but they were found covered by approximately twelve feet of stratified and

undisturbed deposits. Subsequent study by the Palaeontology Department of the University of Arizona established the fact that the sands contained the shells of many small animals which were Pleistocene in age. This ancient lake was undoubtedly not later than the Pluvial period which followed the retreat of the ice and, if the dates supplied by

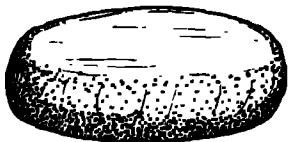


FIG. 24. Oval grinding stone of the Cochise type. The two surfaces are flat and smoothed apparently by use, but the edges are natural rough stone, or show some evidences of hammering.

Antevs may be applied, was older than ten thousand and possibly as much as thirteen thousand years. No detailed anthropological measurements have been published on this material to date.

The second find was in Sulphur Springs Valley, not far from Bisbee. Here Dr. Cummings uncovered the skull (minus the lower jaw) of a mammoth, in a stratum which definitely overlies one in which were found some rubbing stones. These are similar to later combination rubbing and hammer stones, for they are flattened on two sides and show slight indications of having been pounded on the edges. No other types of implements were found. Bones of other extinct mammals, particularly those of bison, were subsequently found in the sides of the washes.

Gila Pueblo has recently become interested in the further tracing of this culture, which has been named the Cochise Culture, in south-eastern Arizona, and has succeeded in making many additional finds.* Sayles has reported other artifacts known to be associated as a complex with the grinding stones. These are flakes and cores in the form of scrapers, choppers, handstones, and knives of the general crude types already noted. Gladwin has pointed out that in the San Pedro valley a

* E. B. Sayles in *Medallion Paper* 29, page 8, has divided the Cochise Culture into three stages, to each of which he has assigned approximate dates and associated culture. The first of these, the Sulphur Spring Stage, he dates as earlier than about 8000 B.C. It consists of many flat milling stones and small handstones, a few percussion-flaked plano-convex implements but no points or blades. Culture of this stage is found associated with now extinct animals. The following Chiricahua Stage has been dated as from about 8000 to 3000 B.C., and is characterized by the presence of larger shallow-basin milling stones, handstones, and biface percussion-flaked implements. Rare pressure-flaked projectile points are probably intrusive. The last, the San Pedro Stage, he dates as from about 3000 to 500 B.C. and characterizes by the presence of a typical mortar and pestle and by a preponderance of chipped implements, both plano-convex and biface, which are frequently retouched by pressure. This stage just precedes that which contains pottery. The next culture is probably represented by the SU site which is discussed later.

more developed manifestation of Cochise Culture has been found, which forecasts or forms a sequence of oval grinding stones, and metates to the earlier forms of Mogollon grinding stones, thus suggesting a definite connection between the two. Most recent work by the University of Arizona in a cave west of Tucson has added much detailed information concerning this culture. It is on the basis of dates supplied by Antevs, and already referred to, that Gladwin has made the statement that cultures in America appear to have developed stone grinding earlier than western Europe, and on the whole produced better flint work at a comparable time.

Summary

From the above it is apparent that, although the various cultures probably will eventually be worked out to represent several distinct lines of development, they now appear more or less of a general complex

DATES 1 A.D.	TEXAS	ARIZONA	N. MEXICO	NEVADA	CALIFORNIA
	↑		↑		
8,000 B.C.	EDWARDS PLATEAU	COCHISE	FOLSOM	GYPSUM CAVE	PINTO BASIN
	↑	↑?	↓		↑
20,000 B.C.	ABILENE	LITTLE COLORADO			MOHAVI
	↑	?			
70,000 B.C.	DURST EOLITHS				

FIG. 25. Table illustrating, in the most general way, the relative age of the various sites and cultures discussed in this chapter. The Folsom Culture would include Folsom, Lindenmeier, Clovis, Burnet Cave, Sandia Cave, and Conkling Cave. The suggested age of 70,000 B.C. for the Durst eoliths remains highly questionable.

which shows many similarities. Two distinct types of points have been isolated, described, and placed as to area. The Folsom point seems to be largely a high plains type, while the Yuma point is most abundantly represented west of the Rocky Mountains. To these might be added several other types which are almost equally distinctive, particularly those from Texas, and the points found in California.

In the most general way it is possible even now to divide the cultures already known into series, as represented in time, the date 8000 B.C. acting somewhat as a base date to which others may be compared. On the basis of the Durst finds Leighton maintains that man lived near

Abilene just before, and during, the last glacial stage (Wisconsin), pointing out as proof the hearths, charcoal, crude implements, and bone refuse found in the Durst silts. Next comes the Abilene Culture which has been placed as directly following this period, in early post-glacial times. From this developed the Edwards Plateau Culture, which although it appears to be about the same time as the Folsom material, or slightly later, is not related to Folsom.

To the west is the California series, the oldest probably the Mohave Culture, which appears comparable to the Abilene and may perhaps be compared to the find at Old Lake Bonneville. Later than Mohave is the Pinto Basin, which again may be roughly correlated to Folsom. Folsom is represented by several finds in New Mexico and Colorado, including the Folsom site, Lindenmeier site, Burnet Cave, Clovis, Sandia Cave, and Conkling Cave. Gypsum Cave probably was occupied at about this time, and the Cochise Culture was contemporaneous or slightly later. Of all these finds the only one containing human skeletal remains of any consequence is the Cienega Wash site, and these are dated as comparable in age with Cochise only on the basis of stratigraphy and palaeontology, and not by artifacts. The Little Colorado Terrace material may be of almost any date, although it probably does represent a very early human occupation of this area.

Between the date of the Cochise Culture, some 8000 B.C. or earlier, and that of the earliest well-established and well-recognized culture in the southern part of the state, there is a gap of about eight thousand years. This appears to be bridged by the typological series previously suggested, which gradually changed to the relatively elaborate Mogollon and Hohokam culture stages.

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Chapter VIII

BASIC CULTURES

In the preceding chapter the various finds of early cultures in the Southwest were discussed, and now, before undertaking a detailed review of the well-known later cultures, it would perhaps be advantageous to determine just what these later cultures and their relationships are. Much has been stated or implied about basic cultures, but as a rule these ideas are not too accurately defined.

If a culture is to be considered truly basic it should certainly form the base or foundation upon which later cultures have been built. Thus a basic culture might be defined as the earliest definite culture from which others may be traced. To do this with accuracy it is necessary to be able to show that later people are definitely, even genetically, related to the first or earliest well-known group. This requires a detailed knowledge of the archaeological history of the cultures considered.

In late years, many archaeologists not closely associated with the Southwest have felt that practically all the problems of Southwestern archaeology have been solved, so that the time of interpretation is not only at hand but has long been delayed. To those individuals who are actually at work in this field it is very obvious that the story is far from complete. For many years intensive investigation, often excavation, has been carried on in certain sections. In the early stages, and to a lesser extent now, field parties set out with the express purpose of returning with as much material as it was possible for them to gather. This wholesale artifact collection was necessary so that additional funds for other projects might be secured, for large institutions, requiring quantities of display material, were usually responsible for financing. Such an attitude has resulted in much work being done on large sites, where many burials and quantities of pottery were certain to be found.

In several portions of the Southwest there are no large standing ruins to mark the site of a profitable excavation, and these sections have largely been ignored. Small sites, such as individual pithouses, are

often rather difficult to locate, generally requiring a good deal of systematic surveying. In other regions these inconspicuous dwellings have been covered by thick deposits of silts or drifting sands, or perhaps have been blown out to leave only slight vestiges of their original location. All these factors make it difficult for a large expedition to enter the field, quickly choose a site, and profitably dig it.



General view of Cliff Palace in the Mesa Verde. The characteristic excellent masonry is illustrated, as well as circular kivas and circular and square towers.

As a result large areas of the Southwest have not been completely examined archaeologically. A look at the accompanying map of Arizona and the western portion of New Mexico will indicate how little territory has been covered by serious excavation. The San Juan and Little Colorado areas have been rather intensively worked, as have portions of the Upper Gila and the most productive spots of the Middle Gila area. Other than this only small sections, represented by a few sites, have been dug in important locations. Actually the rest of the state is

fairly well covered with evidences of prehistoric culture, and though most of it has been surveyed, comparatively little has been dug.

Archaeological surveys, of the types undertaken by Gila Pueblo, the Museum of Northern Arizona, and the Laboratory of Anthropology, are a necessity to archaeological work. They quickly fill in some of the blanks in areas which could not otherwise be known until actual digging was undertaken, and they indicate the most important sites where excavation may be done to the greatest advantage. But even the best

surveys can do little more than give a general impression of house types and ceramic complexes. Occasionally stone objects may be collected from the surface, but as a rule they do not form an appreciable portion of the material gathered.

Even in those areas where serious excavation has been undertaken, only a part of the story is known. In the northern portion, including the four corners district, considerable detail is known of the Pueblo III culture stage, for these large sites have been dug

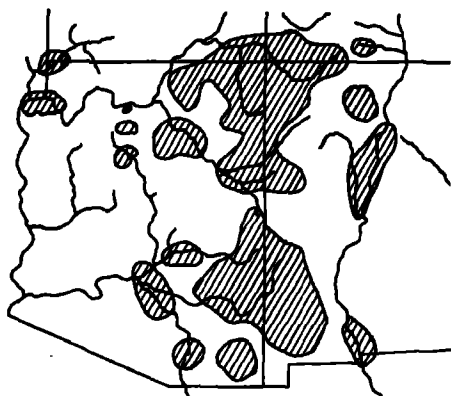


FIG. 26. The shaded or hatched areas represent those sections in which serious archaeological work has been done, usually digging. The blank portions have been surveyed only on the surface.

over a period of many years, and it is here that three-ring dates have been found most abundant and most easily obtainable. Also in the Flagstaff area intensive work has been done on the Pueblo II culture stage: several thousand sites have been surveyed and accurately located, and more than two hundred dug or tested. Even with all this intensive work, which has led to the statement that the Flagstaff section is probably the one archaeological area in the world about which the most detail is known, only a far from complete history may be written, for in such open sites perishable objects have disintegrated.

As time goes on, and additional information accumulates, ideas of course change, not only as regards details of culture, but also in designating what is a basic culture. What may be considered basic at one time will perhaps be found at a later date to have been preceded by another

group. At the beginning of Southwestern studies, and still to an extent by some writers, all cultures found here were considered to be only various local differentiations of the general Pueblo Culture. In this light it would be considered a basic culture.

In the chapter dealing with the history of archaeology it was pointed out that at a very early date some individuals had perceived that Basket Maker preceded the true Pueblo Culture. This implied that there were two basic cultures in the Southwest, for it was at first felt that each was distinct from the other. Later Gladwin added the name Hohokam to designate the culture characteristic of the desert section. This made three distinct cultures, all of which were felt to be basic.

Because of the obvious chronological and cultural relationship between the Basket Makers and Pueblo people, many individuals have felt that they should be grouped together under one name. Kidder, in 1936, proposed the term *Anasazi* to cover these two groups and so make it possible to refer to the entire archaeological history of the plateau at one time without using both Basket Maker and Pueblo. If this is used it is possible to refer to the cultures of the Southwest as simply *Anasazi* and *Hohokam*.

In 1934 Gladwin had already recognized four basic cultures, which he called roots. These are: *Caddoan Root*, *Basket Maker Root*, *Hohokam Root*, and *Yuman Root*. In this system he designates *Basket Maker* as basic to the Pueblo development, and both as characteristic of the plateau area. The *Hohokam Root* is the term he applies to the Hohokam people who inhabited the Middle and Lower Gila areas. With the recognition of the *Mogollon Culture* as distinct from other cultures in the Southwest, he felt the need for a third root, which he labeled the *Caddoan Root*, and which might be located geographically as of the eastern mountain section. His fourth root, the *Yuman*, is found in the Colorado River and Kingman areas, but also apparently spread over into the Lower Gila area. It was from the archaeological surveys undertaken by Gila Pueblo in this western region that Gladwin was able to point out the distinct ceramic complex of this section and justify calling it a separate root.

Following this list of Gladwin's, and including the term proposed by Kidder, Colton also has most recently agreed that there are four roots in the Southwest. These he lists as *Anasazi*, or *Pueblo*, *Hohokam*, *Mogollon*, and *Patayan*. Two of the terms suggested by Gladwin have been changed — *Yuman* to *Patayan*, and *Caddoan* to *Mogollon* — for



General view of Dogoshibiko canyon in north central Arizona. This canyon is characteristic of the topography of the northeastern part of the state. It is in the tall sandstone cliffs that natural caves were commonly occupied by prehistoric Indians.

it was felt that names already commonly applied to linguistic groups, and not to cultural ones, should not be used to designate prehistoric cultures. Otherwise the connotations have remained the same.

The present tendency is to recognize four basic stocks or roots in the Southwest. Actually it would appear that there is still considerable uncertainty in the designation of basic cultures or roots. Of all those mentioned above, the least is known about the Patayan, for it is within an area which until very recently has been only surveyed, although actual excavation, usually considerable, has been done in all the others. For this reason it will be impossible to characterize this culture in detail, although the work now being done by the Museum of Northern Arizona will soon shed more light on this problem. The existence of such a culture has long been suspected, as a result of the intensive work at Flagstaff, where it could be seen that the early force of western traits had made itself felt. What few traits are known of this culture will be discussed in a later chapter.

A good deal is known of the remaining roots, though probably the least of the Mogollon, for only a few Mogollon sites have thus far been dug. Even so, it is possible to compare them and to point out the distinctive characters of each. Such a comparison should be useful at this time, for if these traits are firmly fixed in mind they will be found of the greatest value in making later discussions more understandable.

First, the Hohokam. They made all their pottery by the paddle and anvil process, and fired it in an oxidizing atmosphere, producing red, red-on-buff, and buff types. Pithouses, that is, structures the floor of which was below the then existing surface of the ground, were the only type of dwelling. Irrigation was widely practiced. The typical axe has a groove running around three sides, as a means of hafting, and is known as the three-quarter groove axe. Molded spindle whorls were used. The Gila shoulder (to be discussed more fully later) was a common occurrence on certain types of pottery. Complex shell carving and even etching was done. Stone work is, on the whole, excellent, some stone vessels being carved. Bone work is also remarkable, some examples being carved in full round.

In comparison, true Pueblo Culture may be characterized as containing certain equally distinctive features. The most typical pottery was black-on-white, which was fired in a reducing atmosphere, although small quantities of oxidized pottery were also made early, and are the only type now being made by the Hopis. The coiling and scraping

process was used almost exclusively in forming vessels. Inhumation, as opposed to cremation among the Hohokam, was practiced. Intensive agriculture was characteristic. Axes, with a complete or full groove, were typical. The kiva was present, and widely used as a ceremonial chamber. The skull type was round and artificially flattened posteriorly. Surface structures were generally found to have replaced pithouses by the time Pueblo Culture had become well established. Spindle whorls and the Gila shoulder were both absent. Shell work was simple, stone work mediocre, and stone vessels were apparently not Puebloan. To this list might be added the use of the digging stick in cultivation.

People of the Mogollon Culture fired their pottery in an oxidizing atmosphere, to produce red and buff colors. They also coiled much of it, but made some by the paddle and anvil process. Early burials were found to be flexed inhumation; later, cremation was practiced. The physical type was an undeformed round head with a low vault. Pithouses were typical, early forms being circular, the later rectangular. Shell objects were rather simple, and stone work mediocre. Stone vessels were not uncommon, and the stone hoe seems to have been the chief implement of cultivation. In many respects Mogollon is somewhat intermediate in culture between Hohokam and Pueblo.

Basket Maker Culture, on the other hand, shows much individuality. Pottery, appearing only toward the end of this culture stage, may hardly be said to be typical. What was made was modeled from a mass and fired in a reducing atmosphere to form grays and black-on-grays. The physical type was long headed and undeformed, and flexed inhumation was practiced. Mauls were of the full grooved type, and what crudely formed axes have been found seem to be full grooved. The pithouse, or cist, normally circular, was typical. Shell was rare, and stone work on the whole mediocre. The digging stick was present to the exclusion of the hoe, and basketry largely took the part of pottery. Fabrics, of fibers other than cotton, were also typical, particularly a distinctive form of sandal.

From these lists it readily may be seen that Basket Maker Culture stands out most markedly from the rest, although it does show some relationship to Pueblo Culture. Mogollon and Hohokam show many characters in common, and have actually been found to be closely related in their earlier stages. Thus it would appear that there are only two basic cultures in the Southwest; one which gave rise to Hohokam and Mogollon and perhaps to Patayan, and the other which formed the Basket Maker and Pueblo. That these five groups are distinguishable cannot be



Betatakin Cave, in which Betatakin Ruin lies. This is one of the most beautiful settings of any cliff pueblo in the Southwest.

denied, and in actual practice they have been found of the greatest use in designating their respective distinct cultures, but that they are not the bases from which Southwestern culture developed is almost certain.

At this time it is impossible to give complete arguments for the belief that there are actually only two bases from which all later culture sprang, but in the summary at the end of this volume the evidence which is contained in the following chapters will be reviewed. At present it is sufficient to suggest that a Mogollon or Mogollonlike Culture was probably the earliest highly developed and distinctive culture in Arizona. Just what name should be applied to this early basic culture is open to question. It is from this base that both Mogollon and Hohokam,

as regional differentiations, appear to have developed.

The Basket Maker Culture seems to have been the earliest definite culture in the plateau country to the north, and although it shows many minor similarities to the Mogollon it also shows some very striking differences. An important determinant in a comparison of these people is the long head of the Basket Makers, as opposed to the round head of the "Mogollones." Pueblo Culture developed from Basket Maker, probably as a result of

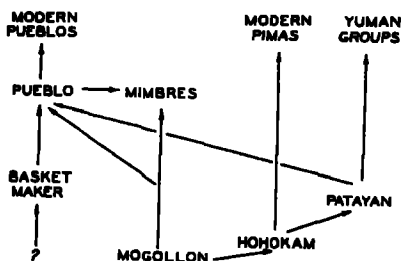


FIG. 27. Diagram illustrating the relationships of the various cultures mentioned. Of these the writer would designate only Basket Maker and Mogollon as basic cultures, upon which the rest lie. Arrows indicate the direction of culture influence. The modern Pima and Yuman groups are not proved descendants of Hohokam and Patayan.

strong influences from the Mogollon people. Somewhat in the same manner Mogollon, plus Pueblo influence, gave rise to the Mimbres. See Fig. 27.

Although little is specifically known as yet about the origin of the Patayan Culture it quite possibly was from the Hohokam, simply representing a regional differentiation, much as the Hohokam from the Mogollon. Modern groups which developed from these prehistoric cultures are probably the present-day Pueblo people from the Pueblo Culture, possibly Pimas or Sobaipuris from the Hohokam, and the Yuman-speaking groups of the Colorado River from the Patayan.

Even after the culture sequence has been carried back to the point where there are only two groups, we are still confronted with the ques-

tion of *their* source. The staff of Gila Pueblo has been^{*} searching for the origin of the Hohokam for several years, and as a result located and identified the Mogollon Culture, but has not as yet found the source of the Hohokam. It has been suggested that possibly the ancestor of the Mogollonlike basic culture is the Cochise.

The possible origin of the Basket Maker Culture is even more vague. Perhaps the Little Colorado Terrace people will be found to have been their ultimate ancestors, although at present no evidence of direct contact is known. However, Basket Makerlike cultures are not confined to the plateau of northern Arizona, and the bordering states, for somewhat similar materials have been found in Chihuahua, Mexico, and as far east as the Mississippi valley, where non-pottery-making people seem to show some similarities. Basket Makerlike finds were also described from New Mexico, as overlying Folsom and Yumalike cultures. If there is any relation between these two groups no such cultural indications have yet been discovered. There are actually more similarities between Mogollon, some of the California grinding stone cultures, and the Basket Makers, than there are to any of the other early cultures which have been mentioned, but these are not close enough to warrant any suggestion that one was derived from the other.

At this time, therefore, it is necessary to be content with the indication that there are two sources or two basic cultures from which later cultures in the Southwest have been derived. Because they have no known direct ancestry, no other name may be suggested than those already applied to what appear to be the most fundamental groups, the Basket Makers and the Mogollon people. The data upon which the implication that the Mogollon or Mogollonlike culture is relatively ancient and basic will be taken up in the next chapter, when the earliest definitely and completely understood culture in Arizona, and in fact in the Southwest, will be discussed.

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Chapter IX

HOHOKAM CULTURE FROM A.D. 1 TO 500

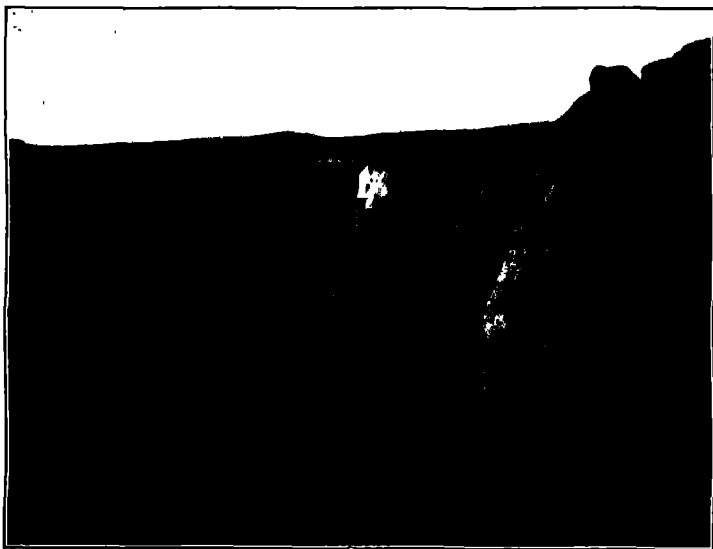
PIONEER STAGE

Although an historical sequence of events has been presented in this book, as they are believed to have developed in Southwestern archaeology, it must be borne in mind that actual information, as a result of archaeological work, is often secured in the opposite order. Late sites are usually dug first, so that the most information is acquired about them, and from this, earlier cultures are indicated and eventually investigated. Only when many data are at hand is it possible to reverse the events and write a history.

This has been true of the work in the Gila area, for here the large still standing sites were the first to be worked. It was not until a fairly good knowledge of these surface sites had been secured that earlier ones were investigated, for they consisted of much less impressive pithouses. Not until history had been carried well back into the pithouse stage was it realized that even these cultures were certainly not the earliest that must have existed in the desert section, and Gila Pueblo, who had been most intensively investigating the problem of the Hohokam, began a serious search for still earlier sites.

Widespread surveying had indicated that certain sites were earlier than others, and, of these, Snaketown Village appeared the most likely to give a long sequence of development. This site, located on the Gila River near Gila Butte not far from Chandler, Arizona, not only was of exceptional size, but also contained several huge trash mounds. As has already been pointed out, it is trash mounds which generally give the most convincing stratigraphy in archaeological work, so these were quickly trenched in order to establish a sequence for this site. As digging progressed it became apparent that Snaketown was earlier than had been originally thought, and soon such quantities of cultural material were uncovered that the eyes of many Southwestern archaeologists turned to it with envy.

Before any serious discussion of this site may be undertaken, it is necessary to review more carefully the means of classification of the Hohokam Culture as applied by Gila Pueblo. It has been explained previously that their period or stage divisions are subdivided into phases, which are smaller cultural manifestations in definite areas.*



A view from the Tucson Mountains looking out across the wide flat sand deserts of the desert section. This is a typical view of the desert country.

From the work at Snaketown a much longer series of phases was developed than had been possible from any other site in this area, and for convenience these have been presented in the accompanying chart. Following the lead of the geologist, all such charts in this book are arranged with the earliest phases at the bottom and the most recent at the top, just as they are found in stratigraphic sequences.

The history of the Hohokam has been divided into four distinct stages, the earliest of which is the Pioneer. Following this in order are the Colonial, Sedentary, and Classic, with possible, but thus far not demonstrated, Decadent and Historic Stages. The Pioneer, the one

* The term "stage" has been substituted for "period," for although these divisions have been dated, and so might be considered periods, they are primarily stages in a general sequence of culture development.

now under consideration, has been subdivided, on the basis of Snake-town, into the Vahki, Estrella, Sweetwater, and Snaketown Phases, each of which may be characterized by certain distinctive traits. Although these phases are of the utmost importance and interest, it will be impossible to discuss each of them in detail; discussion will be limited to the Pioneer Stage as a whole.

PERIOD	SNAKETOWN	CASA GRANDE	TRADE POTTERY	DATES 1350 A.D.
CLASSIC		CIVANO		1200
	SOHO	SOHO		1100
SEDENTARY	SANTAN	SANTAN		1000
			P.I. BLACK MESA B W. - KANA-A	900
COLONIAL	SANTA CRUZ		P.I. KANA-A B W.	700
	GILA BUTTE		S.M.III. LINO B/GRAY	500
PIONEER	SNAKETOWN			300
	SWEETWATER			100
	ESTRELLA			100 B.C.
	VAHKI			300

FIG. 28. Chart illustrating the periods and phases of the Hohokam as found at Snake-town Village and at Casa Grande. Under the column headed trade pottery are listed the types which have been found intrusive at Snaketown. In the early portion of the Sedentary Period, Black Mesa Black-on-white and some Kana-a Black-on-white sherds were found; in the Santa Cruz Phase only Kana-a Black-on-white, and in the Gila Butte Phase only Lino Black-on-gray, a Basket Maker III type. It is on the basis of such ceramic correlations as these that the early dates for the Pioneer Period have been established by Haury, and the right-hand column of dates gives his correlation.

Gladwin in the final report on Snaketown attempted to date the Pioneer Stage and the various phases represented, and he has made a very convincing case for the dates which he applies. In the stratigraphic sequences worked out for this site no trade pottery from the plateau area has been found in phases of the Pioneer Stage. The earliest types from the plateau occur only in the Colonial Stage, indicating that the entire Pioneer existed at a time previous to the making of pottery in the plateau.

A glance at the chart, Fig. 28, will show that Lino Black-on-gray was found in the Gila Butte Phase of the Colonial Stage, while Kana-a

Black-on-white was found in the Santa Cruz Phase. In the Sacaton Phase of the Sedentary Stage occurred both Kana-a Black-on-white and Black Mesa Black-on-white, the latter a Pueblo II type of pottery in the plateau. Later Sedentary and Classic Stages of culture have been correlated with so many types traded from the plateau, which have been accurately dated there, that the dates included in this chart are certainly well established.

On the basis of these correlations, it has been pointed out that each phase appears to have required about two hundred years to develop, a phenomenon which has also been noted by the Museum of Northern Arizona for the plateau area. Maintaining that each of the phases of the Pioneer Stage represents at least as much cultural development as these later phases, he counted back from the end of Gila Butte, or the date A.D. 700, allowing two hundred years for each preceding phase, and thus arrived at the date of 300 B.C. for the beginning of the Vahki Phase. This is a very ably presented argument and one which will probably carry a good deal of weight in many quarters.

Should this date eventually prove correct it will place the early cultures at Snaketown, in southern Arizona, as earlier than any other pottery-bearing culture in America which has thus far been more or less accurately dated. However, the writer feels that dating on the basis of a standard rate of cultural advance is probably no more reliable than similar attempts at placing dates on the amounts of rubbish known to accumulate over definite periods, and then multiplying the total rubbish deposit by these amounts. In either case the rate of progression or accumulation may be radically altered by factors not now apparent to the archaeologist.

Pioneer Hohokam Culture, even in the earliest phase, is an already well-established culture, certainly indicating a previous ancestry in some other area. As will be shown later there are reasons to believe that Mogollon and Hohokam are closely related, perhaps the latter being derived from the former, in which event the developing force of the early Hohokam would have come from the east. At any rate, the parent stock probably still exerted strong influences on this group after it had located in the Gila valley, and it may have been from this source that additional culture traits were derived from time to time, instead of having been developed locally in the Gila.

There is no doubt that considerable cultural change took place in the Pioneer Hohokam Stage but it certainly does not appear to have been any greater than, and in fact in many ways it seems to have been parallel

to, the development which took place in the plateau from Basket Maker to Pueblo Culture. In the plateau section a distinct pre-pottery culture was flourishing, in local areas possibly as late as about A.D. 650, and by A.D. 950 it had altered to a highly developed Pueblo Culture. Thus, within a period of about three hundred years, a most remarkable change was effected. By comparison, the known evolution of the Pioneer is certainly not greater, but a period of eight hundred years has been indicated to cover these changes. It is for these reasons that a more conservative date of about the time of Christ has been suggested for the beginning of the Hohokam in the outline which will be followed here, a period still including five hundred years.

With this suggested readjustment of the time required by the Pioneer Stage, it may be identified as that occupation of the Gila area previous to about A.D. 500 by a pottery-making, agricultural, pit-house-building people. If the assumption, several times previously referred to, that the early Hohokam and Mogollon Cultures are much alike, in fact probably being identical at their beginning, is true, any more exact characterization of the Pioneer Stage as distinct from Mogollon is almost impossible. Because this culture is so recently discovered, and has apparently not been fully traced out as regards distribution, the area occupied by these people is equally difficult to indicate.

Snaketown has been located on the accompanying map, and as it is the only site which has been dug to date that shows definite indications of Pioneer Culture, it may be considered the type site. Near Tucson the Hodges site, also, seems to be of this culture, and as work progresses it may prove the connecting link which is so badly needed between the Hohokam and Mogollon. Several early ceramic types at Snaketown appear to have been made in the Mogollon country, as shown by a spectroscopic examination of temper and paste, and for this reason the Mogollon area is suggested as belonging to this same general group. If lines are drawn connecting these three points, as has been done on the map, the area of most typical representation of the Pioneer Hohokam probably will be found to lie somewhere within this triangle.

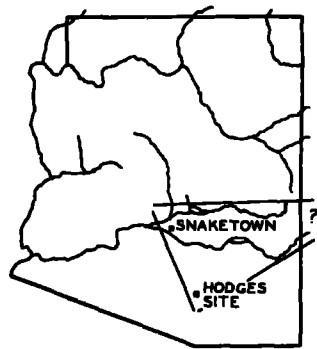


FIG. 29. Map showing the location of Pioneer Period sites thus far known and dug in Arizona.

At Snaketown all phases of the culture, as now understood, are, of course, well represented. The earliest phase shows an unpainted pottery horizon, and later what appears to have been the development of the art of painting designs on pottery. At the Hodge site, only painted pottery horizons have been found to date, although they include some of the later types found in the Pioneer Stage. Unfortunately no Mogollon sites have yet been reported which seem to be of anywhere near equal antiquity, although Gladwin suggests that Mogollon 1:15 appears to be a pre-pottery site.* If this should be true it may prove to be the Mogollonlike ancestor for which search is being made.

Turning now to an examination of the material traits of the Pioneer Stage as represented at Snaketown, let us first consider pottery. Haury has listed seven pottery types as occurring in the Pioneer Stage: Vahki Red, Vahki Plain, Gila Plain, Estrella Red-on-gray, Sweetwater Polychrome, Sweetwater Red-on-gray, and Snaketown Red-on-buff. Vahki Red is found throughout all phases of the Pioneer Stage, while Vahki Plain is confined to only the Vahki or earliest phase. Gila Plain appears to have developed from Vahki Plain, beginning its existence in the Estrella or second phase, and lasting to at least A.D. 1350 in the Gila area. Estrella Red-on-gray, Sweetwater Red-on-gray, and Snaketown Red-on-buff are all characteristic only of the phases to which they belong, but they show development, one from the other, in the order named.

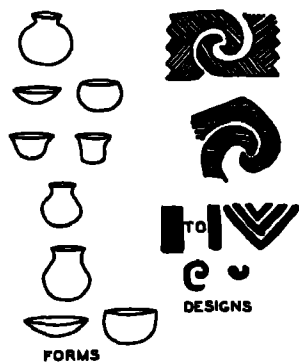


FIG. 30. Forms and designs of Pioneer types of pottery. Both run from the bottom up in time, the lowest forms are from the Vahki Phase, the first designs from the Estrella, and the top row from the Snaketown Phase.

Vahki Red is a most interesting type because it seems to be quite typical of the early reds of this culture. Though it is relatively rare, about four per cent of the total pottery in Snaketown, it was made locally, as shown by temper studies. It is red-brown in color, slipped and polished, and was constructed by the paddle and anvil method. Mica flakes used as a tempering material occur in some abundance. They provide an easily recognizable distinction when comparing this type with its close relative, San Francisco Red, from the Mogollon area, which does not

* The recently reported SU site is such an early Mogollon village.

show mica temper. Vahki Red appears to have developed from San Francisco Red but is on the whole less well made. The forms are both bowls and jars. Bowls are the more common, the coils on the outside often being outlined with incised lines in those specimens from the Estrella phase, so that they are markedly distinct. Vahki Red is so far known only from Snaketown.

Vahki Plain, which seems to be the direct ancestor of Gila Plain, is as well made as any later forms of Gila Plain. Quantities of fine mica flakes were used as temper, and they show through on the surface. The color is brown to gray, with moderate polish. The forms are both bowls and jars. This type forms ninety-six per cent of the pottery of the Vahki Phase.

Gila Plain is one of the most widespread, basic, and long-lived types of the desert area. The color is gray to brown, often mottled outside and blackened (smudged) inside. There is no slip, so that the surface is slightly rough to the touch. The paste contains much coarse mica tempering, and, like all these types, it was made by the paddle and anvil process. There is a strong suggestion of similarity to Alma Plain of the Mogollon Culture, which has led Haury to feel that they are related.

Of the painted types, Sweetwater Polychrome is by far the rarest, being known only from one scoop and several sherds. The color is black and yellow-on-gray. It is mentioned here only because it is undoubtedly the earliest polychrome pottery made in the Southwest, but it apparently never enjoyed much popularity with the Hohokam people.

The three other decorated types are of much more interest, for each of them is indicative of a definite phase. Estrella Red-on-gray, typical of only the Estrella Phase, is the earliest painted pottery of this area, although it forms only about two per cent of the total pottery of this phase. The paint is red on a light gray or brown background, often showing fire clouds, and is polished, sometimes after the painted design has been applied, to spread the paint slightly into the background. Designs consist of broad simple parallel lines, very crude, or rudimentary hatching, no interlocking scrolls, and occasional small elements. As an additional design element, coils on the outside of bowls are often outlined by incising with a sharp pointed implement, or this incising is arranged in parallel lines to form geometric designs.

Sweetwater Red-on-gray is a red paint on a gray to light brown surface, which has been smoothed. Exterior coils are also incised with a sharp tool, to form a deep V-shaped groove, and are occasionally painted

over with a design. Definite hatching, some of which is rather fine and regular, is a marked change in style of decoration which distinctly separates it from the preceding type.

Snaketown Red-on-buff is a red painted design on a buff to gray surface, which has been polished but not slipped. The background of this type is lighter, tending to be more buff than brown, than that of

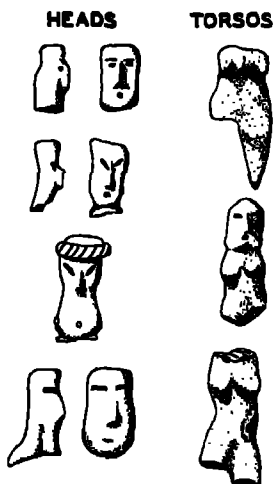


FIG. 31. Clay figurines from the Pioneer Period. The earliest are at the bottom of the columns, the latest at the top. The two types, heads and torsos, are both shown.

the earlier types. More than half of the bowl exteriors are incised with very fine, regular, deep scratches. The surface is also painted over with a design. Very fine regular hatching is characteristic of this type, to distinguish it from the preceding.

From this it may be seen that three general classes of pottery are found to be characteristic of the Pioneer Stage. One is a red surfaced type, the second is a plain undecorated group, and the last is painted with red designs on a brown or buff background. This last class often has incised exteriors, which may be painted over, and shows a series of development in painted designs from simple broad lines to very fine hatching. Only the plain type survived into later periods.

In the Pioneer Stage horizon at Snaketown a great many clay human figurines were found. These may be grouped into two general classes, torsos and heads. The torsos are strongly suggestive of similar human figurines found in the Basket Maker Culture in the plateau, and this latter group may well have taken the idea of modeling them from the Hohokam. The heads find no close parallel in the Southwest but are very strongly suggestive of those typical of the Archaic horizon in the Valley of Mexico. Characteristically they are flattened, with a depressed back, slits for eyes and mouth, and with a raised or pinched-up nose. See Fig. 31.

Dwellings are all of the pithouse type. The earliest, or those few found in the Vahki Phase, are extraordinarily large for a Southwestern pithouse and, in fact, in general size and arrangement, strongly suggest some of the prehistoric plains pithouses. Though there is great variation in size, all of them follow a somewhat similar pattern, in that they each

possess an entrance passageway, which was probably covered, and a fire-pit directly in front of it but within the house. The earlier houses had roofs which were primarily supported by four posts set well within the room, thus giving a central square top to the house. The latest type, or that belonging to the Snaketown Phase, showed a marked change in roof support, for only two posts were used to uphold a main gable or central beam.

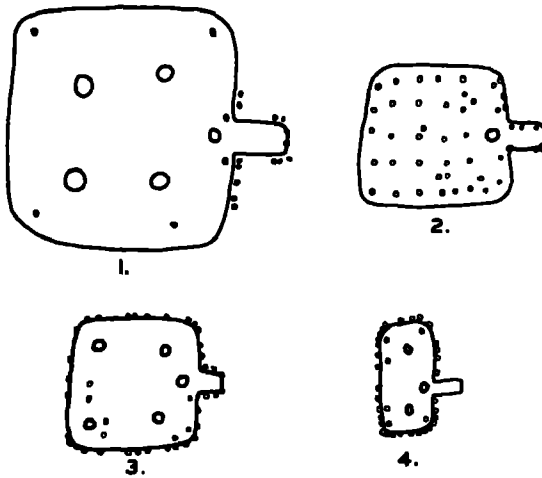


FIG. 32. Floor plans of house types found in the Pioneer Period. 1 is a Vahki house; 2, an Estrella house; 3, a Sweetwater house; 4, a Snaketown Phase house. All are drawn to about the same scale for comparative size and have been taken from Sayles' portion of the Snaketown report.

All these structures were relatively shallow in comparison to their size, which not only decreased from earliest to latest, but also became more elongated from the original almost square form. Around the edge of the floor of the larger structures was a trench, which, it is likely, served as a base for the poles forming the sides. The Estrella house, illustrated in the diagram of floor plans, shows a surprising number of support beams, a feature which apparently recurred in later phases in the Tucson area. In this structure there is no definite arrangement of roof supports, and in fact there are so many posts that it is hard to imagine how humans were able to occupy this house.

Over the supporting beams were laid cross sticks, bark, grass, or other material, and then a plaster cover. Viewed from the outside, they probably would have appeared more like mounds of earth than like dwellings, and from the inside they must have resembled a log-lined cyclone cellar or vegetable house. (See diagrams.)

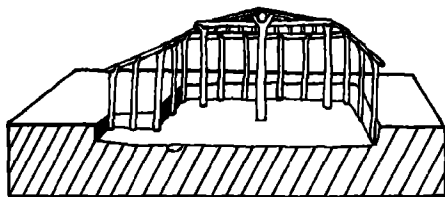


FIG. 33. Diagrammatic illustration of the pit-house structure typical of the later portions of the Pioneer Period. The framework only is shown here, the outer covering being removed.

One of the most consistent traits of the Hohokam was cremation of the dead, to the sorrow of the southwestern archaeologist, for only a few Hohokam skeletons are known. Therefore it is not possible to give any data on the physical type of these people. During the Pioneer Phases bodies were cremated in fires which reduced them to small quantities of very badly burned and broken bones. These, with the equally fractured offerings of pottery, ornaments, and other objects, were buried in pits or trenches, which were dug through the looser topsoil into a hard layer of caliche or lime-impregnated earth. Throughout most Hohokam Periods, it was the custom to make burials in certain areas; where once one is located others are almost certain to be found.

Stone culture of the Pioneer Stage is of interest because it was during this time that the foundation was being laid for the very fine stone work which was

to follow. Although some mortars of vesicular basalt, well formed inside but with irregular and unshaped outsides, and long slender cylindrical pestles, have been found in this period, they were certainly not the main grinding implements. For this purpose metates and manos were most

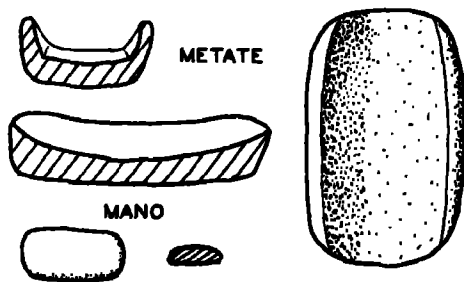


FIG. 34. Diagram illustrating metate and mano types of the Pioneer Period. The right-hand figure is a vertical view of a metate, the two left figures are cross and longitudinal sections. The two lower figures are a vertical view and section of a typical block mano.

generally used. The one-hand mano is the most common type, although some very long ones, obviously used with two hands, were also made. Manos are generally shaped somewhat like a brick, though after they have been long in use they tend to wear down into thinner slabs.

The most typical Pioneer metate is the open-end form with relatively high sides and a concave section both laterally and longitudinally. Into this fits the characteristic rectangular mano with slightly rounded ends and corners, which was rubbed back and forth through the trough of the metate to grind the grain or other material. Much has occasionally been made of the presence of metates in early cultures on the supposition that they were always used in grinding corn, but this is not necessarily true, for other seeds and nuts might equally well have been crushed in them. Haury has suggested that corn was grown from the beginning of Snaketown occupation, although carbonized corn was not found earlier than the Colonial Period.

Stone palettes, used for the grinding of pigments, appear to have had their inception in the Vahki Phase at the beginning of the Pioneer Stage. The first forms are relatively small sandstone slabs, roughly rectangular in shape with rounded ends and corners and a flat grinding surface. From this developed a more definitely rectangular form, strongly suggesting the prevailing type of metate with raised sides and open ends, for a distinct rim extends down both sides and partly across the ends. The last form to be found in this period is larger, flatter, and with a distinct raised rim about the entire edge; it is only one step removed from the elaborate slate palettes so typical of the desert area in later times. This apparent evolution from the metatelike form to a distinctive shape is most interesting, for the parallel in use as a grinding base in both objects cannot be denied.

The stone axe of the Hohokam has already been characterized as of the three-quarter-grooved type, but those of the Pioneer Stage are of particular interest because of the very marked ridges above and below the hafting groove. Also, the bit of these axes is quite long and slender, a feature which has been felt to be more characteristic of much later

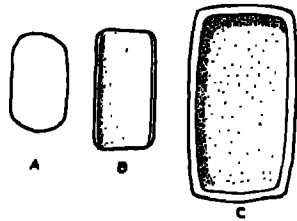


FIG. 35. Diagram of palette types of the Pioneer Period. *A*, a flat slab only, is the earliest type. *B* has a raised rim on the sides and strongly suggests the open-end type metate. *C* is the latest type with a low raised rim about the entire edge of the palette.

forms. On the whole they are exceptionally well made and finished stone artifacts. No mauls have been found.

Stone bowls were relatively abundant at this time. Although they were not so highly ornamented or so well made as later ones, they were certainly characteristic. They are almost invariably inclined to be straight sided, are symmetrically made, and may be plain or decorated with incised geometric designs, most of which are comparatively simple. Several symmetrical and very well-made stone discoidals, suggestive of bowl forms but not hollow, have also been found, as well as one long slender vesicular basalt cylinder of unknown use. An increase in excellence of all stone artifacts is noted from the earliest phase to the latest of this stage.



FIG. 36. Type of stone axe characteristic of the Pioneer Period.

A few crude animal effigies, mostly of vesicular basalt, have been found in the last two phases. In the last, or Snaketown Phase, a mica schist stone knife with serrated edges and attached shaft which had been carved out of one piece, as well as a carved slate resembling a curved wooden club, were found. These are exceptionally well-made objects and perhaps were originally designed for some sort of ceremonial purposes. A very well-made stone dipper is also of this stage.

Probably the most interesting object of this sort is a small human stone statuette from the Snaketown Phase. It was carved in the full round, of granite, and though not expertly done, is rather well made. The figure is in a squatting position with a shallow bowl resting on the lap.

Few arrow points have been found in this horizon, but enough occur to establish the use of the bow and arrow at this early date, probably the earliest in the Southwest. These are light points of exact outline and careful workmanship.

Heavier points, which have been considered knives or dart points, are

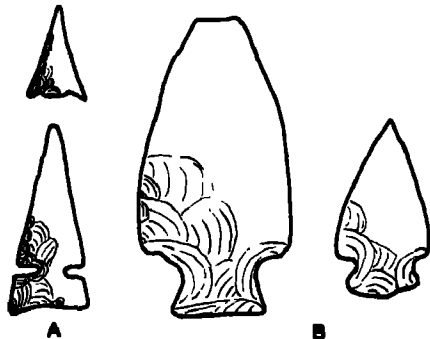


FIG. 37. Types of chipped stone points from the Pioneer Period. Those above A are fine well-flaked points, probably arrow points. The ones above B are knives or dart points.

more abundant and show much cruder flaking. Not enough of any of these have been secured to make it possible to establish characteristic types.

Both whole shell beads, simply ground off at the ends for stringing, and flat circular perforated beads have been found. Shell bracelets and pendants were also common. Although some carving was done, it was largely incising, or cutting out the original material as pendants in the form of various objects, and never in the full round or in relief. The most outstanding bone objects are several bone tubes incised with designs. These are relatively short sections, and most of the patterns are rectilinear, although one with a lizard design has been found.

Because of the open nature of the Snaketown site, and in fact most of the sites in the desert area, no perishable material has been recovered from the Pioneer horizons. Thus, nothing is known of cloth, basketry, sandals, and similar objects.

As regards hunting implements, it has already been suggested that the bow and arrow were used, and it is quite possible that the atlatl and atlatl dart might also have been known. If the curved stone mentioned above is a representation of a curved wooden club, this could be added to the list of weapons.

A very brief review of the outstanding traits of the Pioneer Stage has now been finished, and a summary of the most typical of these traits may be attempted. Pottery is probably the greatest aid in identifying a Pioneer site, and, of the types which are most useful, Vahki Red, though occurring in very small quantities, is probably the best of the undecorated for it occurs throughout all phases and does not carry over into other stages of this culture. The three decorated types, Estrella Red-on-gray, Sweetwater Red-on-gray, and Snaketown Red-on-buff, are perhaps even better indicators of the last three phases of the Pioneer Stage.

Houses of the earlier phases are distinctive, being of huge size and having a quadrilateral roof support arrangement. Those of the later phases are not so distinctive for they are of a type similar to, though perhaps not so slender as, still more recent houses, which survived far beyond the Pioneer. The fact that they are all pithouses does not distinguish them, for all true Hohokam dwellings are pithouses. This generalization is likewise true of cremation, and the method of disposal of the remains in trenches or pits carried over into the next stage.

Of stone objects probably the most distinctive is the axe, with its markedly raised ridges about the three-quarter groove. In no other way

does it appear particularly distinctive, for the long slender bit and careful workmanship are carried into later times. Second in importance would certainly be the stone palettes, which are rectangular with somewhat rounded ends and corners and have either slightly raised rims or a flat surface. Later types are much more elaborate and highly ornamented.



Grooves in a sandstone boulder where stone axes were sharpened.

Clay human figurines are of some use in determining this period, though perhaps not so markedly distinctive as other objects. They are of both torsos and heads, the torso suggesting Basket Maker forms, the heads being much like those of the Archaic horizon in the Valley of Mexico.

This constitutes the list of distinctive traits, for, without other Hohokam Stages as a direct comparison, it is impossible to point out the absence of certain traits as a characteristic. Actually this will often be found a most useful means of identifying cultures, for common traits

which do not occur within a site when many others do are as distinctive by their absence as the others by their presence. For that reason later lists will include the absence of traits where they are of importance.

SOURCES AND ADDITIONAL REFERENCES

GLADWIN, HAROLD S. Excavations at Snaketown II. Comparisons and Theories. *Medallion Paper* 26, December, 1937. Gila Pueblo, Globe, Arizona. (This has been a most fruitful source of information on general problems relating to the Pioneer Stage and is probably the most immediately useful as an introduction to the history of the Hohokam.)

GLADWIN, HAURY, SAYLES, and GLADWIN. Excavations at Snaketown, Arizona. *Medallion Paper* 25, December, 1937. Gila Pueblo, Globe, Arizona. (This has been the only source on the material culture of the Pioneer Period which is available to, and has been used by, the writer. All the illustrations have been taken from this text, and most of the theories herein expressed will be found in this volume. To any serious worker on the Hohokam, it should serve as the basic work of reference.)

Chapter X

HOHOKAM CULTURE FROM A.D. 500 TO 900

COLONIAL STAGE

In the preceding chapter the most outstanding culture traits of the Hohokam Pioneer Period have been briefly reviewed as illustrated by the finds made at Snaketown Village. Since it is the only site of this stage thus far dug, it must be relied on alone for information concerning this time and area. As it was an unusually large village, even for the Hohokam Culture, it undoubtedly assumed a position in this prehistoric group somewhat comparable to that held by one of the larger cities in our own culture. It is in such dense metropolitan areas that the leading craftsmen are concentrated and the majority of outstanding art objects produced. As a result the picture obtained from this site is probably not quite typical of that prevailing in the average small village of this area and time.

In all, three Colonial Hohokam sites have been dug and reported on, thus giving a much broader picture than that of the Pioneer Stage. A large portion of Snaketown was found to be of this culture, and because it is most meticulously reported will serve as a basis of comparison for the other sites. The Grewe site, which lies just east of Casa Grande ruins, was dug by the Los Angeles Museum, and proved to be exceptionally rich. The third site was dug by Gila Pueblo at Roosevelt Lake. Both of these are smaller than Snaketown and show many remarkable identities of culture, though apparently lacking a few of the outstanding traits found at the larger site.

Because so few sites of either Pioneer or Colonial Hohokam have been investigated it is not possible to make as fine divisions of culture as might be desired. It is necessary to carefully review and compare the culture of many sites in an area before detailed distinctions may be made, so that it is only in later cultures, or in the discussions of Pueblo Culture, that they may be safely attempted. For this reason the Pioneer

Period has been made to include both the Pioneer and Founder Stages, or to extend from about A.D. 1 to 500.

The Colonial Stage has been divided into two phases (see Fig. 28), which are based on cultural distinctions and represent temporal horizons. Although these two phases are distinct, they are in many ways not so well marked as comparable periods in Pueblo Culture. The earlier, or Gila Butte, has been dated as from about A.D. 500 to 700, while the later, or Santa Cruz Phase, appears to have lasted from A.D. 700 to 900.

As tree-ring dates are wholly lacking in the desert area, dates applied to the culture of this section must be derived from well-dated northern pottery types which have been traded to these people. See Fig. 28. Not only have Basket Maker III and Pueblo I sherds been found at Snaketown, but the same types were also found at the Roosevelt and Grewe sites. The two most common of these traded types are Lino Black-on-gray and Kana-a Black-on-white, the dates of which have been listed in the chapter on pottery. From these several checks it is possible to assign convincing dates to these phases and this stage of culture.

The accompanying map is an effort to indicate, at least approximately, the range of Colonial Hohokam Culture. The data from which it was made were secured by Gila Pueblo from a widespread sherd survey in the desert area. In the collection of this material relative percentages of sherds which were diagnostic of culture stages were carefully prepared. This chart was supplemented by a series of maps published by Gila Pueblo, which locate most of the sites diagnostic of each of these stages. See bibliography. The inner area of fine hatching in Fig. 38 is that which contains the most typical sites of this culture stage; the outer hatched area is simply intended to give a general idea of the maximum limits to which marked influence succeeded in spreading. Neither boundary should be

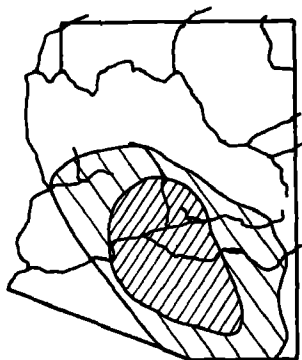


FIG. 38. Map roughly indicating the area occupied by the Colonial Hohokam Culture. The area of fine hatching is that section showing the most abundant, typical, and highly developed culture; the area of wider-spaced hatching roughly delimits the extent to which the culture had spread. This map, and the others on the Hohokam, have been derived from maps published by Gila Pueblo in various *Medallion* reports as a result of wide surveys of the Hohokam.

considered fixed, for additional information will almost certainly alter these maps. However, it may be clearly seen that the main Colonial Hohokam Culture lies in the Middle Gila area, centering on the Gila and Salt Rivers and extending only slightly farther west than their junction.

Hohokam Culture at about this time seems to have become much more stabilized than during the Pioneer and to have taken on a more distinctive general character. The alterations which are apparent at about A.D. 500 are great, probably somewhat comparable to those changes from Basket Maker to Pueblo in the north. Not only did the

arts become more standardized but also Hohokam influence, even at this early date, appears to have been spreading widely to influence other areas, probably most specifically to the west.

Pottery might most profitably be considered first, for here, as everywhere else in the Southwest, it is one of the best indicators of culture. As has been suggested, Gila Plain carries through all Hohokam stages in some abundance from its first appearance in the Estrella Phase of the Pioneer Stage. Since this type has been described it will not be repeated. Besides Gila Plain, Gila Butte Red-on-buff is characteristic of the Colonial, and Santa Cruz Buff and Santa Cruz Red-on-buff of the later or Santa Cruz Phase.

Gila Butte Red-on-buff is of particular interest in that it is probably somewhat transitional between the decorated Pioneer types and the later well-standardized Colonial types. It was

made by the paddle and anvil process, but the surfaces are well smoothed, the first wash or slip being applied to this type. The color is buff, although fire clouds are common, a fact which tends to darken the otherwise light color. Forms are bowls, possibly the most outstanding character being the tendency to flaring rims (see the upper right-hand figure in the illustration), jars, scoops, plates, and pedestal vessels. Although hatching still survived, probably the most characteristic design feature of this period was the greater abundance of small repeated elements, and short parallel lines, often as a fringe. Shallow incising into the plastic

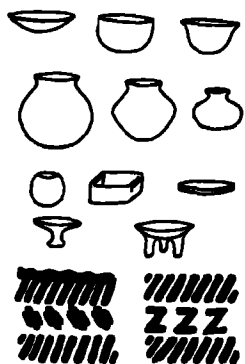


FIG. 39. Characteristic forms of Colonial Red-on-buff and plain pottery, as well as typical small repeated elements of design. Probably the most characteristic forms are the jar and flaring-rim bowl.

clay of the surface with a blunt implement is also very characteristic of the outside of bowls and jars of this type.

Santa Cruz Buff, though rare at Snaketown, is a type which is distinctive largely because of its exceptional thinness of vessel wall, surface lightly washed and smoothed, and the presence of only small jars with handles. Handled jars are not typical of the Hohokam, but this type, as determined by careful analysis of paste and temper, was made by these people. Because of its relative rarity it is only mentioned here.

Santa Cruz Red-on-buff is the identifying type of the Santa Cruz Phase. As was true of the other types of the Hohokam, it was made by the paddle and anvil process, with careful smoothing on the decorated surface, which had a light slip. Another feature by which most pottery types made in the Gila may be identified is noted in this type: small flakes of mica, probably secured with desert sands, form a portion of the temper. The color is buff with a pinkish tendency. The flaring-rim bowl is a characteristic form, but rectangular vessels do occur. Heavy-walled vessels are of this type, as well as of others, and apparently are characteristic only of Hohokam Culture. It has been suggested that they were used somewhat as an incense burner, for many of them show traces of carbon on the inside. Jars, plates, scoops, ladles, and even beakers are all characteristic. Small repeated elements are probably the most outstanding features of design, with some negative painting occurring. The jar with wide-open flaring mouth and flaring-rim bowls are the most characteristic forms.

Clay figurines were found only at Snake-town, where enough occurred to establish a type for this period definitely. From the illustration it is apparent that at this time both heads and torsos were still being made. The earlier or Gila Butte type seems to be characterized by the presence of incised eyebrows; the later Santa Cruz type most commonly appears to have had the "coffee bean" eye, wherein a small bean-shaped mass of clay was added to the face to form the eye and was then incised to indicate the lids. These latter types are

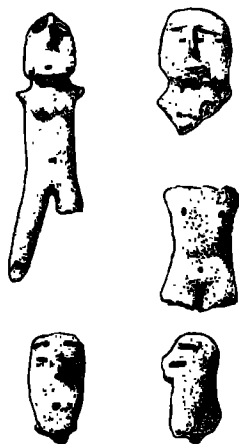


FIG. 40. Colonial clay human figurines. The lower three figures are from the earlier Gila Butte Phase: the upper two are of Santa Cruz Phase. Both heads and torsos are found in this period.

strongly reminiscent of certain Archaic forms from the Valley of Mexico.

Houses are elongate rectangular pit structures, sometimes with rounded ends and characteristically with rounded corners. Although they are quite large, those at the Roosevelt site averaging about twelve by twenty feet, they are relatively shallow, usually from one to two feet

deep. A sunken entranceway gave access to the level of the room on one of the long sides, and directly in front of this, in the floor, was located the firepit. The main roof support consisted of two upright posts on the long axis of the room, although smaller secondary post holes were found around the periphery of the floor. Thus the low-gabled type of roof appears to have still been the rule, and the sides of the dwelling were enclosed with a "wattlework" of reeds which was probably plastered over. In all major characters they are very similar to late Pioneer types.*

One of the most striking and interesting features of this entire culture is the presence in this stage of what have been definitely identified as ball courts. Al-

though only one is known which may be actually assigned to this early time, it is a large and imposing structure, and it has so many striking features that it may be definitely identified as a ball court. A playing floor was excavated into the caliche of the original ground surface to a depth of some four or five feet, and the dirt removed was piled around the periphery to form a wall probably not less than fifteen feet, and possibly eighteen feet, or more high. In the exact center of the floor a stone marker was embedded. The floor, 56.25 meters long and 18.75 meters

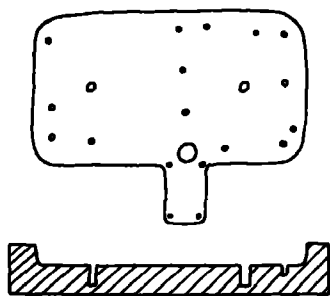


FIG. 41. Plan and section of a typical Colonial house. They are relatively shallow, are rather long and slender, have rounded corners and sometimes rounded ends, a roofed entrance on one of the long sides with a firepit directly in front of it on the floor, and two main support posts.

* Associated with the house groups at Roosevelt, Haury found what appears to have been an outdoor brush kitchen, similar to those in use by the Pimas and Papagos today. This "shade" structure is a most efficient and useful feature in such a climate as that of southern Arizona, for it consisted largely of a roof supported on poles under which cooking and other activities could be accomplished in hot weather. At both the Grewe and Roosevelt sites circular and more or less conical pits were found which gave every evidence of fire, and were filled with fire-blackened and broken boulders. Several theories have been advanced concerning the use of these pits, the most favored of which seems to be either that they were for cooking, or that cholla fruit was roasted in them much as the Pimas and Papagos are now doing.

wide, was in the form of a long oval with almost parallel sides and more or less rounded ends. Although the side walls form a steep angle with the floor, the ends rise gradually to a cleared area which terminates in a low artificial wall.

The original court was built during the Gila Butte Phase but was altered twice, once during the Santa Cruz Phase and again apparently at its end. This would place the original building of the court sometime before A.D. 700 and the final alteration near A.D. 900.

The aboriginal ball game, played in similar courts, is best known from Middle America, where Spanish accounts of the Maya game of "Pok-ta-pok" are fairly complete. It was played with a solid native rubber ball for points, which were scored by striking the ball through rings set vertically into the sides of the court. The player could use only parts of the body other than the feet or hands. Similar accounts come from

Mexico, but here no definite ball courts are known, although they are found as far south as South America. It is an odd fact that the only prehistoric rubber ball known from this entire region comes from the desert section of Arizona.

The amount of labor which the construction of such a court as this represents, when the primitive implements with which the work was accomplished are recalled, certainly indicates such an exceptional social organization and direction as to warrant admiration. This is paralleled only by the construction of extensive irrigation ditches, many of which carried water for several miles from the main streams to the agricultural terraces below the villages.

At Snaketown one such ditch is known to belong to the latter part of the Colonial Stage. Although originally it appeared to be of great width, excavation revealed that it was a relatively narrow and steep-sided ditch. As irrigation will be more fully discussed in the succeeding chapter it will not be described in detail here. It is sufficient to comment that the very arid nature of the country of necessity predetermined the use of irrigation in this area, as soon as considerable populations settled in any

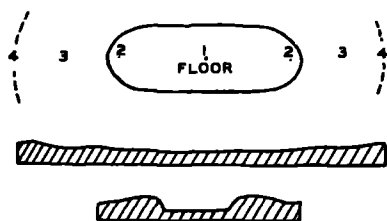


FIG. 42. The large Colonial ball court found at Snaketown. The floor of this structure is 56.25 meters long and 18.75 meters wide. It was probably between fifteen and eighteen feet deep at the time it was in use. 1 locates the center marker, 2 the end markers, 3 the raised cleared end areas, and 4 the raised portions delimiting the end areas.

restricted region. Conversely the establishment of irrigated fields would probably tend to draw additional individuals to the village, so that such a large site as Snaketown might result.

The universal Hohokam practice of cremation still leaves no data as to the physical type of these Indians. Burials consisted of the cremated bones of individuals, together with the fire-broken and often somewhat melted objects burned with the bodies, which were collected and deposited in a shallow depression in the caliche hardpan beneath the soil fill. It will be recalled that the characteristic method of disposal of the bones during the Pioneer Stage was in trenches instead of in individual pits.

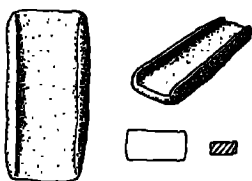


FIG. 43. Long, slender, Colonial metates with raised sides, and a block or brick-shaped mano are typical of this period.



FIG. 44. Colonial stone palette with a raised rim bearing longitudinal incised lines and with a groove around the outside edge. It is made of slate.

Stone implements are abundant, very characteristic, and well made. Metates are of the trough shape, open at both ends and unusually long and slender. Some are carefully shaped on the outside to conform with the grinding surface; others are only crudely shaped or perhaps not shaped at all on the outside. Manos are of the block type, some being exceptionally well made.

Palettes had by now become much more standardized than during the preceding period and had succeeded in evolving into such a highly conventionalized form that they no longer bore any resemblance to metates. They are characteristically made of slate, carefully worked down to a thin rectangular slab with a low raised rim about the periphery. The rim almost invariably bears incised lines forming a design parallel to the edge, usually not deeply cut. These objects are wholly characteristic of the Hohokam Culture of the desert area. The use to which palettes were put remained problematical until Haury uncovered some with the remains of pigments still adhering to them. This bore out the contention that they were used as grinding implements in the preparation of pig-

ments. The labor necessary to produce such a palette would suggest a purpose other than strict utility. Although the rims were primarily decorated with incised designs, some were found at Snaketown in the latter half of the Colonial Stage which had additional ornaments in the form of tabs, carved on the ends. Sometimes these occurred as animal designs, but more commonly they were simply circles. Rarely, raised patterns were carved on the rim, and a few palettes in the form of animals or diamonds have been found.

Stone bowls of this stage were also much more elaborate than those of the Pioneer. They are more carefully made and finished with both incised and relief designs. The best were produced during the latter half, or in the Santa Cruz Phase, some with raised designs of snakes, frogs, or even humans. In the entire Southwest such objects were equaled only by those bowls made during the Sedentary Hohokam Stage, so that the Hohokam people may certainly be considered stone workers of excellence. Besides conventional bowls ornamented with relief figures, occasional small animal statuettes, in the full round, and with a basin in their back, were made. These effigy vessels undoubtedly represent only an elaboration of the bowl form.

Another most interesting feature of the Hohokam is the presence of stone disks which served as the base for a mosaic of plates cut from pyrite crystals. These mosaic plaques are almost identical with pyrite mosaics known to have been in use in Mexico, and are in fact one of the best indications of contact with, or at least influence from or to, Mexican cultures. The base of the plaque is a thin smoothed sandstone slab, slightly rounded or beveled at the edges and drilled with one or two holes as a method of attachment. One flat surface was covered with the pyrite crystal mosaic, so arranged and joined that the individual pieces presented a smooth flat surface, which was essentially metallic and suggests a mirror. It is also quite possible that lignite buttons from the Pueblo

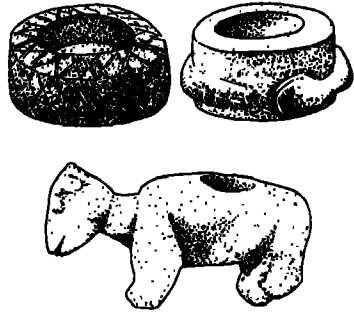


FIG. 45. Carved stone jars of the Colonial Period may have simple incised designs or figures such as the rattlesnake, in half round. The bottom stone vessel is an animal figurine with a hollowed-out basin in its back. Stone carving at this time had already surpassed the best efforts of the inhabitants of the plateau area, even during later periods.

Culture in northern Arizona are an attempt to produce similar mirrors. In the Snaketown report Haury points out that the only two objects from the Southwest and Mexico which show absolute identities are these plaques and copper bells, though many other traits strongly suggest Mexican influences.

The Colonial stone axe differs markedly from that of the Pioneer type in that the raised ridge bordering the groove is lacking. It is also characteristically shorter in the bit and altogether more stocky. The only type found is the three-quarter-groove axe. It is made of volcanic rock

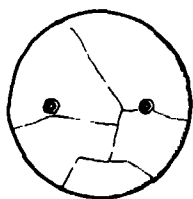


FIG. 46. Stone base of a mosaic pyrite mirror. These are characteristically Mexican objects.



FIG. 47. Colonial stone axes, though well made, are not so striking as Pioneer types. They are generally shorter and lack the raised ridges about the groove, as in the one pictured.

and is well finished. Mauls do not seem to have been used, but hammer stones are relatively abundant. They are of some hard material, such as quartz, most specimens having apparently been shaped largely by use, and as a result vary from spherical forms to irregularly shaped ovals.

Not only did the Hohokam people produce remarkable carved and ground stone objects at this time, but they also excelled in chipped stone. Probably the most characteristic feature of the point was its long slender shape and the presence of deliberately and carefully formed serrations, particularly near the base and along the central portions of the blade. Occasionally these serrations assumed the aspects of barbs. Chipping throughout the point is well controlled, so that they are very symmetrical. Both obsidian and chert were used. Small neck bases and concave wide bases with ears were characteristic, and less abundantly triangular notched points occur. The practical identity to points from the Flagstaff area is a striking feature. Heavy projectile points and knife blades appear to be quite rare.

Unfortunately basketry was not found directly preserved in any of the three sites of this stage thus far excavated, although at Roosevelt

impressions of a coiled basket were found on the inside of a pot, and at Snaketown fragments of what appear to have been a sandal were uncovered. Charred bits of yucca leaf matting are also recorded. The lack of such material, of course, does not mean that it was not produced, for the open nature of the sites would make its preservation most unlikely unless it were carbonized, and preservation by charring requires smothering of the fire before the object is consumed.

At the Grewe site Woodward found a small bowl containing charred cotton seeds. The presence of such seeds definitely indicates that these people had, and raised, cotton, and if they did, it is logical to assume that they wove it into cotton fabrics. This is probably about as early definite evidence of cotton being grown in the Southwest as is known from the plateau, and may actually have been slightly earlier than it was in use there.

Little is definitely known regarding the hunting implements of these people, except that they had, and made use of, the bow and arrow. The small fragile projectile points already described must have been propelled by a bow, for, as has been suggested before, all known Southwestern dart points are heavier and more coarsely chipped. It is not inconceivable that bone awls were also occasionally used as a sort of supplementary hunting implement.

Charred corn which dates from this period was found in the Snake-town site, but no squash or beans were recovered. Animal foods showed a marked increase in the use of small rodents over larger mammals as compared to the Pioneer Stage. In fact Haury suggests that the relation of abundance of corn, rodent remains, and the development of irrigation ditches is marked.

Ornaments were most striking and well made at this time. Probably more than anything else, the Hohokam people excelled in the carving of shell. Most outstanding of such work were the bracelets, many of which were carved in relief and a few cut out by carving so deeply as to cut through the shell. Designs are geometric, many simply of incised lines,

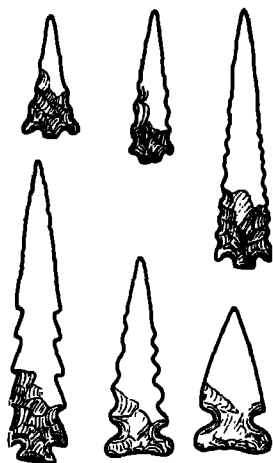


FIG. 48. Colonial points, such as the above, are long, slender, and exceptionally well made, with careful secondary chipping which produced marked and even serrations along the edges.

but others represent highly conventionalized life forms. At the Grewe site Woodward found one such bracelet with a figure similar to the plumed-serpent design of Mexican art. Some are much more lifelike non-geometric such as the simple frog carving represented in Fig. 49.

Small rings were often carved or incised, as well as bracelets, and shell was worked into pendants of various shapes, some in such life patterns as birds. Fragments of cut shell were also used in mosaic work, many representing elaborate small figures. Disk and tubular shell beads were common, the former occasionally being double lobed. Olivella shells

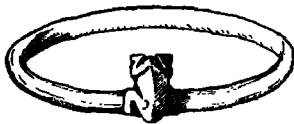


FIG. 49. Carved shell bracelet of the Colonial Period. This carved frog decoration is an example of one of the most simple of these carved shell ornaments, many being much more complex. It was in shell carving that the Colonial Hohokam people excelled.

were used as beads simply by grinding off the end and stringing, or grinding down further and using much like a disk bead. Oliva shells were also strung when only the spire was broken off, and conus shells were drilled in the spire portion to form pendants. Occasionally other flat whole shells were drilled near the beak portion and used as pendants.

Disk stone beads and stone pendants in various forms were manufactured in some abundance. Most of the pendants were flat or silhouette representations of various ani-

mals. Turquoise inlays, mostly rectangular or square, were apparently made even as early as the Pioneer. Painting was practiced both on shell and stone ornaments, but was used rather sparingly.

Bone objects are relatively less abundant and striking than shell. Apparently bone beads are lacking in this culture, and bone awls are certainly not common, the few known being predominantly of the pointed sliver type. It was not until the succeeding period that much use of bone and horn seems to have been made.

With this a review of Colonial Hohokam Culture has been briefly completed, particular attention having been paid to only the most outstanding characteristics. It has been shown that the area occupied is much better known than that of the previous stage and many more sites have been located, three very fruitful ones having been dug. Pottery is rather characteristic, the most outstanding feature probably being designs, wherein the profuse use of small repeated elements is noteworthy. The most striking pottery form is the flaring-rim bowl, with the first introduction of the shoulder in jars. Such peculiar features as rectan-

gular bowls, legged and pedestal plates, and heavy-walled vessels lend variation and character to the ceramics of this time. Figurines are probably more definitely standardized although certainly but little if any better made. The most consistent characteristic seems to be incised eyebrows.

Pithouses are relatively shallow, long structures, with rounded corners or ends, and an entranceway on one of the long sides. The large ball court, which Haury has named the "Snaketown type," is a most outstanding architectural feature. Irrigation ditches also occur. In stone objects the metate tends to be of the long and slender type, with a predominance of the block type of mano. Slate palettes have become highly



Pictographs of this sort are found widely distributed throughout the state.

standardized and are ornamented along the rim. Stone bowls often carry designs, either incised or in relief, and effigy stone bowls occur. The pyrite mirror is characteristic and distinctive. Arrow points are of the long slender serrated-edge type and are remarkably well made. Shell is carved into various forms of decoration, and at the Grewe site bone was also found to have been carved, sometimes in the full round. Thus Colonial Hohokam people were definitely carvers of any sort of available material which could be worked.

Many features of this period of the Hohokam are found to reflect certain Mexican or Middle America influences. Most striking of these are the mirrors, as has already been pointed out. The snake motif in shell carving is suggestive of Mexico, as are the legged vessels. The coffee-bean eye in figurines is also very suggestive of Archaic Mexico. Ball courts certainly indicate some relationship with those found in the Maya area of Middle America. Trade relations of so richly endowed a site as Snake-town were probably widespread, and it may have been by this medium that some of these traits reached the Hohokam, although Haury is inclined to ascribe many of them to local development.

From the above list of traits it is obvious that Colonial Hohokam is definitely distinctive, at least when compared to the culture of the Pioneer Stage. When other cultures are discussed it will also become apparent that it is quite different from any other culture in the Southwest at this time, A.D. 500 to 900.

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Chapter XI

HOHOKAM CULTURE FROM A.D. 900 TO 1100

SEDENTARY STAGE

The evolution of Hohokam Culture from its earliest known beginning would appear to have followed a more or less uniformly progressive course from the Vahki Phase to about the end of the Colonial, or perhaps into the Sedentary Stage. Just what represents the peak of Hohokam Culture is still somewhat a matter of debate, but it has become increasingly apparent in the last few years that the Classic Stage is not actually the highest culture. Probably it was achieved in the Sedentary, for at this time many traits, particularly arts, reached about their highest development.

Although a great many sites of Sedentary Hohokam Culture are known, and though many of them have been examined and a few dug, the only truly systematic review of the material culture of these people is found in the Snaketown reports. The latest occupation at this site is Sedentary as shown by the Sacaton Phase. Gladwin has pointed out that, to the east in the vicinity of Casa Grande, another phase, possibly shorter and nearer the end of the period, is represented. This he has called Santan. However, it is from this one site that the majority of our information comes, and it is for this reason that the illustrations used in these chapters are almost exclusively taken from the Snaketown reports.

Because of the abundance of trade types of pottery from the plateau country to the north which is found in the Gila drainage it is possible to assign quite accurate dates to this stage. Very recently evidences of Hohokam occupation and culture influence have been definitely uncovered in the Flagstaff area, where the associated Pueblo pottery and actual tree-ring dates contributed substantiating evidence to this dating. The Sedentary Stage has been found to correlate quite closely with the Pueblo II Stage of culture, so that dates of A.D. 900 to 1100 may be applied with assurance to both areas.

From the accompanying map it may be seen that the region occupied

by Sedentary Hohokam people is much like that of Colonial times. Perhaps there is a slight tendency for the area of purest and most

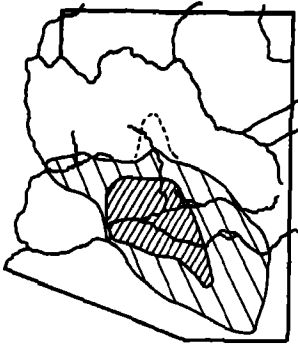


FIG. 50. Outline map roughly indicating the area occupied by the Sedentary Hohokam Culture in the Gila and Salt River drainage. The area of dense hatching is that section which had the most characteristic and abundant sites; the larger area represents the extent to which this culture spread.

abundant sites to be more concentrated in the vicinity of the two main streams, and there is some evidence that, with the exception of the northward extension toward Flagstaff, the tendency was for a restriction of outlying sites.

Pottery of the Sedentary Stage shows several marked changes from that of the preceding periods, particularly as regards form and decoration. Scoring and incising as a decoration is practically absent, and the rare flaring-rim bowl is larger and deeper than the Colonial form. A marked



Gila shoulder has developed, often lying well below the center of the vessel. Tripod and tetrapod vessels are still made, as are rectangular and other eccentric forms. Probably the most striking characteristic of this stage is the prevalence of very large vessels, some of the jars holding as

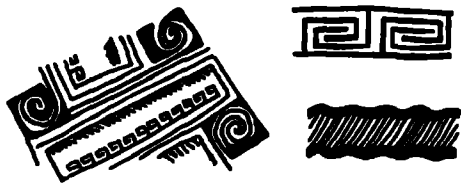


FIG. 51. Sedentary decorated and plain pottery forms and designs. The marked Gila shoulder and the prevalence of geometric designs often blocked out into rectangular areas are very characteristic. Heavy-walled vessels also seem to be quite typical of this period.

much as thirty gallons, and even many of the bowls being of exceptional size. Although small elements still occur as contributing parts of the design, they are usually incorporated as a portion of the complex fabricated decoration. Panels are common, and in their general pattern they suggest fabrics, many being remarkably well laid out in the space they occupy. See Fig. 51.

Specific pottery types which occur at this time are Gila Plain, Sacaton Buff, Sacaton Red, and Sacaton Red-on-buff. In the Santan Phase, Santan Red occurs with a smudged interior and a brilliant red slipped exterior. Sacaton Buff, though not very abundant, is a light buff slipped pottery which otherwise is like Sacaton Red-on-buff. Sacaton Red-on-buff and all other Gila types were made by the paddle and anvil method, the inside of jars occasionally showing distinct anvil marks. There is a light buff slip which often forms a poor base for the iron oxide of the painted design. The surface is smoothed but not polished, much of it giving the appearance of being porous because of the small holes which it often contains. Designs are in band patterns, panels, and a great variety of other arrangements. Panels and hatching are very characteristic, and a few negative designs occur. Interlocking rectangular and curved scrolls also appear very typical. Forms are bowls and jars, as illustrated in the diagram.

Sacaton Red is a heavily slipped, reddish brown pottery, polished inside and smoothed outside. Typologically it is not closely related to the buff and red-on-buff types characteristic of the Hohokam and thus suggests some outside derivation. It is made of native clays, however, and has much mica temper, which often shows through the surface slip. Although the type is very rare it is possible to suggest that forms are almost wholly bowls.

Besides pottery, clay human figurines were found in the Sedentary horizon at Snaketown. They are represented only by heads which show impressions of core-wrapped fiber bundles on the back, as though the body of the figurine was at this time made of fibers instead of clay. Modeling of these objects was very much better than modeling of earlier times, many specimens suggesting a definite attempt to reproduce actual individual characters. Colonial features such as incised eyebrows carried over, but the eyelids are now uniformly outlined and the nose is modeled into much more of a human nose shape.

Houses are very suggestive in general outline of those of the Colonial Stage, being relatively long shallow structures with a firepit in front of the entrance and having two main posts set on the long axis of the floor.

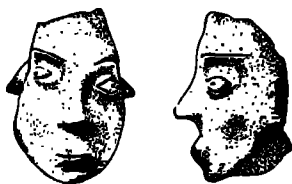


FIG. 52. Human figurines of this period consist solely of heads. They were apparently modeled about a stick so that they have a vertical hollow depression in their back. They probably show a more definite attempt at personal characterization.

The roof appears to have been gabled but almost flat, much like present-day Pima houses. Supplementary posts, possibly as braces, were scattered about the floor, a feature which seems to have been more or less typical of Hohokam houses in periods following the Pioneer Stage. A series of postholes occasionally found outside the wall suggests side-wall support posts and gives strength to the feeling that the side walls

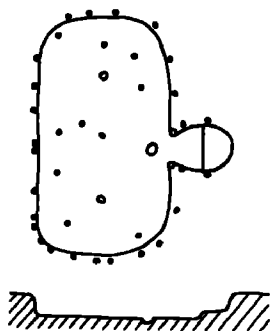


FIG. 53. The Sedentary pithouse is strongly suggestive of the Colonial type in that it is relatively long and slender and shallow and has rounded ends. The firepit and two post arrangement on the central line are also like this type. Only the entrance is markedly different, for it is inclined to be oval and contains a step. This house is about eight meters long by four and a half wide, with an entrance about 2 meters long. A similar house was found near Flagstaff, showing a definite Hohokam influence there.

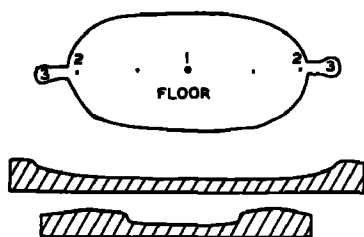


FIG. 54. The type of ball court characteristic of the Sedentary period is much smaller than the Snaketown type. Haury has called it the Casa Grande type. The form is more markedly oval, and the end passages and areas are quite small, 3. The center marker is present, 1, and the end markers, 2, are usually found. The length of the small court at Snaketown was 22.7 meters, its width 10.6 meters. The embankments were undoubtedly not so deep, probably eight or ten feet at the most.

were much like those of Pima structures. The most distinctive feature appears to be an oval or egg-shaped entrance area, which contained a step between the level of the ground outside and the floor of the room. In general, Gladwin is inclined to feel that they are simply a little more comfortable and better-made homes than earlier types.

Ball courts survived into this stage but showed a distinct change from the earlier very large and parallel-sided forms. These structures are much smaller and more oval in shape, with very restricted end passages which flare to small flat areas on the old ground surfaces outside the walls. The central marker and two end markers are typically present,

and in the small court at Snaketown two post holes were also found between these features. This court had a floor length of 22.7 meters and a width of 10.6 meters, or a length about twice that of its width. They were not so deep as the Snaketown type, having walls probably only eight to ten feet high. Several courts of this type are known throughout the Gila area, so that Haury has suggested the name "Casa Grande type" for them. One of the most striking features of these courts is the degree of exactness with which they have been planned and executed. The center marker is invariably located within at least a few centimeters of the exact center of the floor area, and the end markers are usually almost as accurately placed. The general outline is quite uniform, and the angle of the walls consistent in comparable parts of the structure. For this reason, it has been suggested that these primitive people had some sort of measuring device which gave more accurate results than those produced by pacing.



FIG. 55. Cross section of a Sedentary irrigation ditch as found at Snaketown. The actual ditch excavated was found to be much smaller than had been supposed, being a meter or less wide and deep.

A second engineering feat of some consequence was the large-scale construction of irrigation ditches. Casual excavation in ditches in various parts of the Gila led to the conclusion that they were much larger than they actually were found to be at Snaketown. Here the Sedentary ditch was only about a meter wide and deep in the actual excavated portion, though much deeper and higher when the material which had been removed from the excavation and piled on the side was considered. See Fig. 55. Thus the size of the ditches is not so impressive as the extensive systems of ditches which were produced to put large tracts under cultivation. It is the obvious evidence of coherent social organization and direction that is indicated by such undertakings as the ditches and ball courts that warrants admiration of the Hohokam people. Ditches were probably built by digging ahead of the flow of water, which would help to loosen the soil. Even so, the amount of effort necessary to produce many miles of canals was tremendous with the only available digging tools stone or wood implements and baskets.

The prevailing type of disposal of the dead was still by cremation, only a very few inhumations of this period having been uncovered. These were in such fragile condition that it was impossible to deter-

mine a general physical type from them. The inhumations were extended with the head toward the east and appear to have been accompanied with relatively few, or no, offerings. The burned bones of cremations were collected, along with pottery and other artifacts which had been placed on the fire, and buried in a shallow pit in the caliche, or placed in a jar and buried. In some instances the body was apparently burned in the pit, quantities of wood ashes, as well as other objects which had been in the fire, being simply left in the pit and covered over. It was from such sources that many of the finest artifacts found at Snake-town were recovered.



Courtesy of the Museum of Northern Arizona

A cremation found at Winona Village near Flagstaff. The charred bones and ashes were placed in the bowl and covered with another bowl. This is a Hohokam trait.

Ground stone implements of the Sedentary Stage as a whole show only minor differences from those of the Colonial. Metates are of the open-end, raised-side type, though apparently not quite so long and slender as those of the preceding stage. Manos are essentially the same, being predominantly of the rectangular block shape; a few are so long as to suggest that they were used by two hands instead of one. Palettes are essentially the same as Colonial types, and are of slate with raised, decorated rims and some carved, ornamented ends.

Axes appear to be very much like the preceding type, with a three-quarter groove and rounded hammer head. They are longer and more slender than Colonial types but do not show the raised rim or the ex-

treme length of the Pioneer axe. Grooved hammer stones are known but suggest axes which have been broken off on the bit end and reshaped to hammers. Stone bowls were still being made and are obviously a continuation or survival of the earlier types. Several are highly decorated with carved animals; on the whole they appear to be slightly more ornate. Large animal and bird figurines of stone with a depression in their backs were, also, still being made.



FIG. 56. The Sedentary stone axe is very strongly suggestive of the Colonial although apparently tending to be slightly longer and more slender.

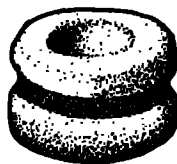


FIG. 57. Stone rings made of vesicular basalt were found to occur during the Sedentary Period at Snaketown. Some of these were grooved, as in the illustration.

One hoe was found at the Snaketown site. It consisted of a thin slab of sandstone which showed obvious wear along one side. This is of particular interest for it has long been assumed that the stone hoe was the typical cultivation implement of the desert section, as opposed to the digging stick of the north. Many stone hoes are known from the Upper Gila area, but they appear to have been less abundant in the Middle section.

Several small stone rings carved from vesicular basalt were also found at Snaketown. These objects are known from the Flagstaff area of northern Arizona, and their possible use has long been a subject of speculation. Actually, they closely resemble stone doughnuts, a few examples being grooved as in the accompanying illustration. It has been suggested that they were used somehow in a game, or perhaps were some sort of symbol or marker. It is interesting to note that twenty-three of these objects were found at Snaketown, a sufficient number to indicate that they are Hohokam in origin.

Points of this stage are exceptionally well made and as might be expected show some eccentric variations. The illustration gives examples of the most outstanding types. The long slender serrated-edge point is apparently the most common, and certainly the most expertly made. Over six hundred of these were found at Snaketown village. The technique of chipping was so well controlled that they are almost unbelievably slender and fine. In some examples the serrations approach backward-tilted barbs. The most extreme specimen, to the right in the diagram, shows one of the several eccentric forms produced at this time, perhaps a natural outgrowth of the barblike serrations on some of the

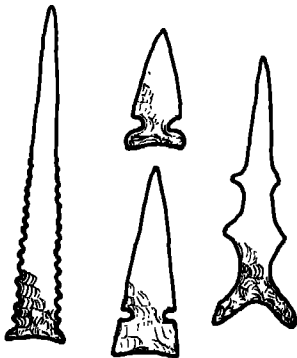


FIG. 58. Sedentary points are strongly suggestive of Colonial types. The long slender serrated edge is characteristic. The right-hand example is an extreme type almost suggesting a barb. The two central examples are obvious developments of the Colonial lateral notched types.

long slender points. The two central points are obviously of a distinctly different type, the upper one suggesting some of those produced during the Colonial Stage and the lower being similar in general outline to points made during the Pioneer Stage. Although this last type is relatively less abundant it appears to be quite typical.

Perishable objects are almost as rare from this period as preceding times, so that no information is obtained on basketry or sandals. However, one fragment of cotton cloth which was recovered proved to be sufficiently preserved so that it could be studied. This was an exceedingly fine textile, very suggestive of similar woven fabrics found in the Verde valley to the north. At first glance it has the appearance of drawnwork or very fine buttonhole work, for small circular openings are arranged in two parallel

lines. Detailed examination proves that this effect was produced during weaving, and not subsequently, and that the weft or filler threads were used to draw the warp threads apart, thus leaving the holes. It is unfortunate that so much of this fine material has been lost, for the few suggestions of textiles from this part of the Southwest are truly remarkable.

Concerning hunting implements, there is very little information beyond the indication, from the small size of the points, that the bow and arrow was the main weapon. Foods also show little variation from those already mentioned.

Ornaments of this time are, as a whole, very similar to those of the preceding stage, although perhaps slightly more ornate. Shell carving is of the same type, but a new and striking technique of shell ornamentation was introduced. This consisted of the etching away of a portion of the surface of the shell to produce a design, a technique which required the understanding of a resist and the reduction action of some acid. Both geometric and life forms were produced on shell by this method. Though not abundant, shell etching is well authenticated by several specimens from sites other than Snaketown, as well as five specimens found at that site. Although shells were occasionally painted by people of this culture, none of the etched specimens show evidences of having been painted. Shell pendants, rings, and bracelets, both carved and uncarved, seem to have been more numerous during this time than at any previous period.

Stone beads of various forms, such as flat disks, button shapes, and pendants, seem to have been very common as well, and stone ear and nose buttons occurred. These last appear to have been typically Hohokam, at least in relation to the rest of the Southwest. None of these ornaments are of sufficiently distinctive character or number to warrant detailed discussion in a review of this nature.

Bone awls were much more abundant and varied than during preceding times. Not only were splinters of bone sharpened at one end used as awls, but the heads of the natural bone were often left as a handle and the shaft pointed. Carved bone handles were also found on implements suggesting awls or daggers. These handles, although not elaborate, were, as a result of the carving, sufficiently roughened to give a better handhold than the ordinary smooth bone surface would have afforded. Painted antler fragments decorated in black and red in geometric designs were found in a cremation. Bone tubes, ornamented with incised geometric and life form designs, were made at this time as well.

Probably the most interesting small objects found at Snaketown was a group of cast-copper bells. A total of twenty-eight were found together, all on the floor of one room where they had fallen at the time the house burned. An analysis of their material indicates they were made of South-



FIG. 59. In one room at Snake-town several cast-copper bells were found. They are of a type almost identical with bells found in Mexico. A stone or copper clapper was cast inside. The example pictured was about two centimeters long.

western copper and not imported from Mexico or the Lake Superior region. All these bells are quite uniform in size and form, are small for Southwestern bells, and have a definite pear shape. The resonator is rounded at the bottom, is slit, and contained a loose pebble or copper fragment clapper cast in the bell. They were undoubtedly produced by the *cire perdue* or "lost wax method," and they may possibly represent the earliest bells known from the Southwest. Certainly most other bells are much larger, more rounded, and appear to come from slightly later horizons.

With this review of the material culture of the Sedentary Hohokam people, it is now possible to summarize their most distinctive traits. Pottery probably forms the best single criterion for this stage, particularly Sacaton Red-on-buff. Forms are jars which have very short necks, with the rims sharply returned upon themselves, and the prevalence of a marked Gila shoulder. Great size seems to have been a distinctive feature of bowls as well as jars. In other forms less marked distinctions are found. Designs are typically geometric, with a strong suggestion of fabric patterns and containing many interlocking, curved, and rectangular scrolls. Human figurines of pottery consist solely of heads, which were apparently placed on fiber bodies and are an obvious attempt at real individual representation.

The distinctive feature of the house is a stepped entranceway, although farther east some walls with pole upright supports seem to have developed in the form of compounds. The ball court is of the small or "Casa Grande type," very carefully made, and of a specific pattern which seems to have been widely copied. Irrigation ditches were abundant and, though not great in cross section, extensive.

Stone axes appear to have been slightly longer and more slender, and other stone objects, though not distinctive in form or design, were on the whole better made. This is also true of shell, wherein a new process, namely etching, was evolved as a means of decoration. The arrow points are remarkably well made, the best of any period in the Southwest, so far as the writer has been able to learn. Exceedingly long and slender types are characteristic, with abundant, even, regular serrations on their edges for the base two-thirds of their length. Copper bells, almost identical with bells from Mexico as to technique of manufacture and general form, were found at this time. They were made by the lost wax method and are distinguishable from later types in that they are much smaller and definitely pear shaped.

In this chapter the Sedentary Culture has been considered as pri-

marily illustrated by the classic Snaketown site in the middle portion of the Gila area. Actually regional differentiation is known in other sections, notably those of the Upper Gila area and in the vicinity of Tucson. As an example of such variation, house types and cremation jars found near Tucson on the Santa Cruz differ considerably from those reported from Snaketown. Data are not now available in published form in enough detail to make these comparisons sufficiently comprehensive to be worthwhile, and for that reason they have not been stressed. Similar regional variations certainly existed during the Colonial Stage but were not mentioned because of a lack of detailed reports concerning them. Thus probably a somewhat misleading impression as to the simplicity and regional uniformity of the Hohokam Culture has been built up. It was undoubtedly a strong culture which had widespread uniform distribution, as illustrated by the many identities between the Grewe site, Roosevelt site, and Colonial Culture at Snaketown, but it certainly cannot be expected to have been everywhere identical. Both Gladwin and Haury have repeatedly alluded to these regional differences, but much more detailed work must be done before they can be isolated and identified specifically.

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Chapter XII

HOHOKAM CULTURE FROM A.D. 1100 TO 1400

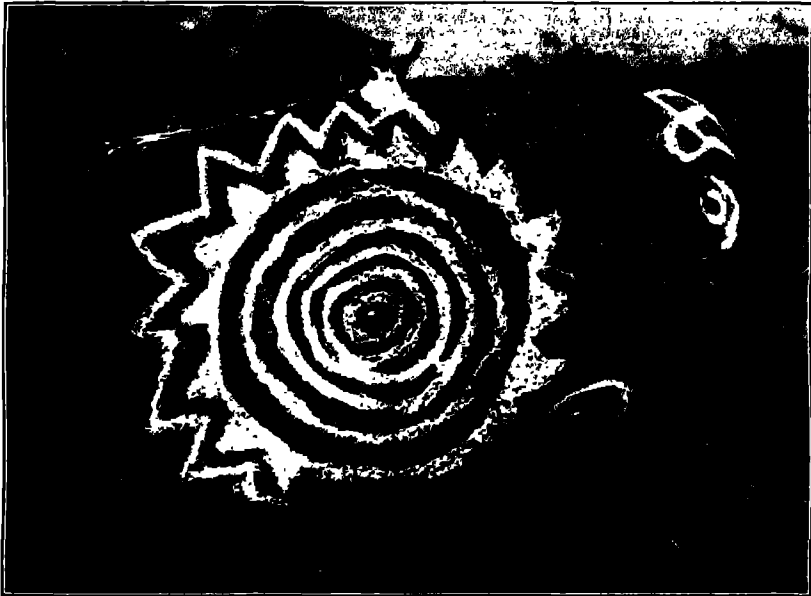
CLASSIC STAGE

Classic Hohokam is undoubtedly the most interesting of any of the Hohokam Periods, for it was at this time that a new culture, the Salado, was beginning to impress itself on the Hohokam people. In general that part of the culture which represents a pure Hohokam group was simply an evolutionary continuance of the preceding stage, the Sedentary. In fact by the latter part of Sedentary time it would seem that early Salado people had already exerted a certain mild influence on the Hohokam inhabitants of the Middle Gila area, particularly in such matters as the multi-roomed surface structures which appeared at about that time. This influence was carried over to the Classic Period, becoming gradually stronger to about A.D. 1300. At this time Salado people themselves entered the Middle Gila actually to mingle with the Hohokam residents, a remarkable example of the peaceful combining of two culturally different groups in single communities.

Because of the intermingling of these two groups any discussion of the culture of Classic Hohokam is difficult. In many respects the two people remained distinct, but it is more than likely that in others they mutually influenced each other to produce a variety of new trait combinations which are actually characteristic of neither. Although a considerable amount of excavation has been done in sites of this late period, much was done before it was realized that two groups had mingled. As a result it is very difficult to determine from early reports what traits belong to either culture, and of the recent work no comprehensive report has been made.

To assign a beginning date to this period is a relatively simple matter, for the end of the Sedentary has been established as about A.D. 1100. The abundance of trade pottery in early Classic sites, which was derived from areas where tree-ring dates may be applied with some assurance, corroborates this date. It is in the question of the end date that difficulty

is encountered. Gladwin and Haury have suggested that the Classic Period lasted to at least A.D. 1400, and certainly Salado Culture had removed from the Middle Gila area by about that time, although it may have lasted in the east as late as A.D. 1450. The problem revolves about the question of how long the Hohokam people retained their distinctive



Pictograph found in the Gila area. This style is commonly called a sun symbol. It is quite common throughout this section.

character after their association with the Salado people, and before they apparently disappeared from the scene as a distinct archaeological group. The approximate date of A.D. 1350 which has been suggested for this event appeals to the writer, although Gladwin still feels that they may have survived into modern times in certain sections of the desert area with only a perishable culture. Thus the end date of the Classic Hohokam Period is much less certain than the beginning. Trade pottery from such sites as Gila Pueblo, which has been dated by tree rings, would indicate an end date sometime between A.D. 1350 and 1400.

Gila Pueblo has suggested that there are two phases making up Classic Hohokam. The earliest of these, the Soho Phase, is dated as about

A.D. 1100 to 1300, although the present feeling is that it may be somewhat later, while the latest or Civano Phase existed from 1300 on to the end of the period of occupation, or, as has been suggested above, to about A.D. 1400. It is the Civano Phase which shows such an abundance of Salado characters, and in fact it probably consisted largely of that culture.

The region occupied by people of Classic Hohokam Culture is illustrated by the accompanying map. From this it is immediately obvious that the area of greatest concentration has been so reduced as to include now only that section at and immediately above the junction of the Gila and Salt Rivers. The area of maximum distribution also is greatly reduced, probably with its main extension southward along the Santa Cruz River to include Tucson. An examination of the two similar maps for the Colonial (Fig. 38) and the Sedentary Periods (Fig. 50) clearly

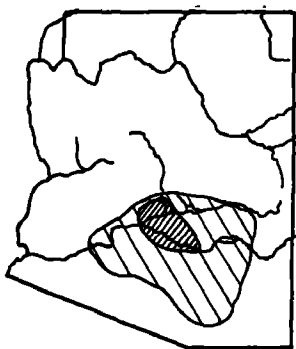


FIG. 60. Generalized map showing the area of greatest concentration and greatest distribution of Classic Hohokam Culture. This, and the other Hohokam maps, have been derived from Gila Pueblo publications. As will be noted the area has been greatly reduced at this time.

illustrates the continual shrinkage of the area occupied from about A.D. 500 on. When Pueblo Culture is discussed it will become evident that an analogous situation is found in the plateau from a period of maximum expansion at about A.D. 1000 to the greatly restricted area occupied by the Pueblo people today.

That this culture was still quite virile and that the people were congenial to their neighbors is amply illustrated by the many types of trade pottery found in relative abundance in ruins of the Classic Period in the Middle Gila. Pottery types from all over the desert area of the Southwest are commonly found in these Middle Gila sites. A surprising number were also traded to them from the Pueblo area. There is some evidence that two important commodities went north in exchange. These are fine cotton fabrics and shell. The evidence for shell is probably the stronger, for quantities of marine shells from the Gulf of California are found in the plateau country, and it is quite likely that much of this material traveled through the hands of the Hohokam people. Some of the finest cotton fabrics produced in the Southwest have come from the Gila drain-

age area. An extraordinarily fine piece was found at Snaketown, and the Tonto cliff dwellings and Verde valley salt mines have produced others. Such contacts once definitely established with the north by about A.D. 1000 must have continued to the end of Hohokam Culture.

Pottery characteristic of the Classic Period is Gila Plain, Gila Red, and Casa Grande Red-on-buff. Besides these native Hohokam types, two Salado types, Gila Polychrome and Tonto Polychrome, were made in the Middle Gila area at this time. Gila Plain has already been described in detail. Gila Red is of considerable interest, for although it arrived

ahead of the actual Salado people it has many suggestive Salado characteristics. The paste is porous, often with conspicuous mica temper, and was made by the paddle and anvil process. Forms are jars, bowls, some quite large, pitchers, and an abundance of eccentric animal or plant effigies. Two distinctive features characterize this pottery: the insides are smudged black and are either polished or dull, and the exteriors have definite parallel striations — a characteristic which has often given rise to the term "onion skin" in describing this type. The striations are obviously deliberately placed to form a sort of decoration, for they radiate from one or two focal

points. This character is a distinction from similar types of other regions. The exterior of Gila Red bears a bright red slip, usually with fire clouds which mar its otherwise beautiful surface.

Casa Grande Red-on-buff is the last of the red-on-buff types produced in the Gila area and is not abundant in comparison with the other types found in Classic sites. Probably the most distinctive feature is in the jars, all of which have the vertical necks of the preceding period. It was made by the paddle and anvil method, the surfaces smoothed, sometimes almost to a polish. The surface color is a light buff and the decoration an iron red. Certainly the most common form is the large jar, or olla, with a vertical neck, and often holding upwards of thirty gallons. Bowls occur but rarely. The decoration seems to have been a continua-

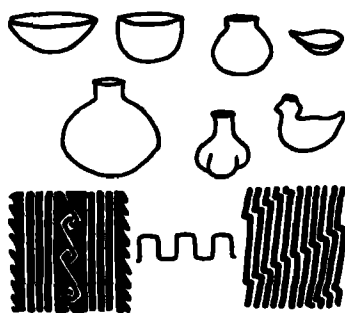


FIG. 61. Classic pottery forms and designs of both Red-on-buff and Gila Red types. Designs are found on the vertical necks of jars. The animal and plant forms are found in Gila Red; the Gila shoulder is much less marked on jars, which are still large.

tion of the preceding period with much use of paneling and a suggestion of fabric designs. The use of negative painting seems to have become highly developed, particularly in scrolls and frets. Although the Gila shoulder is retained it is in modified form, and there is a tendency for jar bodies to be nearly globular.

As Gila and Tonto Polychrome will be discussed under the heading of Salado Culture, it is only necessary to mention that they are black-and-white-on-red in color, and in peculiarities of forms suggest some relation to Gila Red.

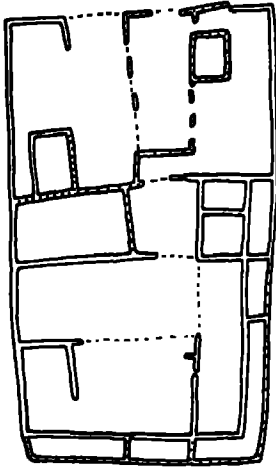


FIG. 62. Generalized plan of house found by Gladwin at Sacaton:9:6, and belonging to the early or Soho Phase of the Classic Period. The walls without dots are solid adobe; those with dots are poles covered with a layer of adobe. Both types have relatively thin walls. After Gladwin, 1929, p. 33.

House types are interesting because they show considerable variation and much influence from outside. As has already been suggested, there was a tendency during Sedentary times for houses to emerge from the ground and become surface structures. This was probably a culture trait derived from the southward- and eastward-moving Salado people, who had by now occupied most of the mountainous portions of the Upper Gila area. These people brought with them most of the architectural features of the Pueblo which they had secured from the plateau area to the north where the true Pueblo type of house had already been evolved. It is quite possible that the eastern Hohokam, coming in contact with the "Saladoans," copied their type of house and then passed only the idea of this type of structure on to their relatives to the west.

Probably one of the most interesting early Classic sites showing this influence was dug near Tucson under the direction of Dr. Cummings, and by the Arizona State Museum. This site proved to be a series of rectangular pithouses with step entrances very similar to those already described as typical of the Sedentary Stage in the Central Gila Basin. However, in some places the houses were found to have been placed with the ends within a foot or two of each other, thus leaving a wall of earth between. Some of these walls had subsequently collapsed and been repaired by rebuilding the wall of rocks and clay, probably

marking the introduction of masonry in this area. The groups of two or three contiguous pithouses, several such units of which formed the site, were connected by a wall which continued around the entire point of the ridge upon which they lay. This arrangement is very suggestive of the compound which became the characteristic type of structure of Classic Hohokam.

The next step in the architectural development of this section was the introduction of surface houses, an excellent example of which is found at Sacaton:9:6. Here Gladwin has reported a structure strongly suggesting the pueblo-compound type of dwelling produced by the Salado people, but made of adobe walls instead of rock masonry. Probably the most interesting feature of this site is that the walls contained posts set vertically into the center of the adobe to act as a primary support for the rest. Interwoven between the spaced posts was small brush, a type of wall somewhat suggesting present-day Pima construction. As a result of this interior strengthening the walls were very thin, possibly eight inches, and so never could have supported more than one story. Long and irregularly shaped rooms were previously used by these people in this area, a feature which carried over into the later heavy adobe-walled compounds. This type of construction is believed to have belonged to the earlier or Santan Phase.

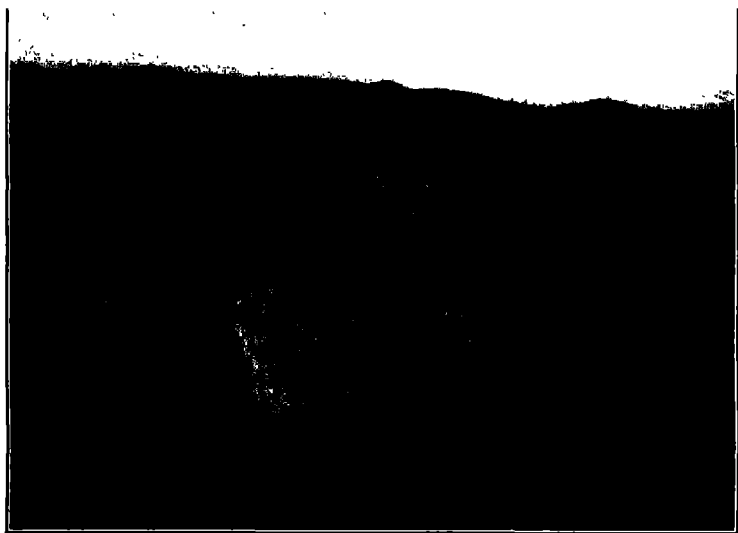
During the later or Civano Phase, typical compounds came into being. Probably the classic example of this type is compound A found at Casa Grande ruins. The walls are made of puddled adobe, without reinforcements, and reached as much as four stories high. The main house at Casa Grande has walls four and a half feet thick at their base, which were constructed by building successive layers or blocks one above the other. Many of the rooms here are very narrow and irregularly shaped. All the main rooms are included in a high surrounding compound wall.

The shape of many of these compound rooms, which would probably render them unfit as domiciles, has led to the suggestion that most of the actual homes of these people were of a more perishable nature and outside of the large adobe compounds. Surface brush structures, somewhat suggesting Pima houses, have been found in this section, apparently associated with the compounds, and it is quite likely that the main population lived in these houses.

It was during the Classic Period that irrigation reached its greatest development in the Gila, ditches apparently being larger and watering greater areas than at any other time. Estimates of the number of acres

under cultivation approach present-day figures in the sections in which old irrigation was practiced. In fact many of the ditches used by the prehistoric people have simply been cleaned out and incorporated in modern systems. Apparently cross profiles of these ditches were very similar to, though perhaps slightly larger than, those already discussed.

Although some inhumations have been found in the Classic Period, it is doubtful whether they belong to Hohokam or Salado people, as it is not uncommon for both Polychrome and Red-on-buff pottery to be buried with an individual. However, the characteristic method of dis-



A large site excavated by the Arizona State Museum in the Santa Cruz drainage area near Tucson. The heavy adobe walls superimposed on older ruined structures constitute a characteristic situation.

posal of the dead still seems to have been by cremation. During the Soho Phase in the Central Gila area the cremated bones were most often placed in a jar, less commonly under an overturned pot, under a mass of broken sherds, or in association with several vessels. To the east, in the vicinity of Bylas, the Arizona State Museum has uncovered several cremations placed in large jars each covered with a bowl. These may belong to the end of the preceding period, but the vessels might be either Red-on-buff or Polychrome. In several cases one was Polychrome while

the other was Red-on-buff, thus showing that the two people were in contact at this time, and so suggesting the Classic Period.

The stone implements appear to be very much like those of the preceding period. Metates and manos are about the same, and mortars formed in bed rock were also used. Stone palettes are definitely lacking, but the stone axe is well made and of the rather long, slender, three-quarter-groove type. Mirrors and carved stone bowls were not made at this time. Points, surprisingly enough, are rather scarce, possibly even more so than in preceding periods. Perishable materials such as basketry, sandals, and cloth fabrics are either lacking from the sites known to have been dug or are unreported by the workers. Hunting implements are represented only by arrow points.

Figurines were apparently no longer made, but various forms of jewelry survived. One of the best examples comes from Casa Grande, where a pink shell bird-shaped object with a border of inlaid turquoise was found. Unfortunately it is impossible to be absolutely certain which group was responsible for the production of such things, for turquoise inlaying was practiced by both the Hohokam and Pueblo people in much earlier times. Cutout shell pendants in animal forms, also, seem to have been made at this time. *Very little or nothing is known of bone and horn.*

In summarizing the traits of the Soho Phase Gladwin lists the following: pottery jars had vertical cylindrical necks, decorated in patterns of straight lines, and Gila Red came into general use; houses were sometimes contiguous, but of only one story. These traits he also considers characteristic of the Civano Phase, but would add the following traits of Salado Culture: multi-storied, heavy-walled, adobe houses; Gila and Tonto Polychrome pottery; inhumation; compounds; the hoe; and arrow straightener.

Thus, in summary, we may only point to pottery types and house types as characteristic of this period. The most striking pottery feature is the vertical-neck olla, second the presence of lifelike forms, particularly in Gila Red ware, and Polychrome types. True Hohokam houses are never

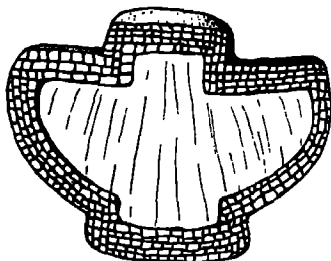


FIG. 63. Pink shell ornament with blue turquoise mosaic found in Casa Grande Ruins. This may be either Hohokam or Salado, but it represents a high type of ornament of this period.

of more than one story, and these are probably an outgrowth of influence from the Salado people who made definitely multi-storied compound buildings of heavy adobe walls in the Central Gila Basin area.

Allusions have been made to differences in various areas at this time, and it might be well to mention very briefly two slight but noticeable culture variations in two marginal regions. In the Santa Cruz area, to the south of the central section, and in the vicinity of Tucson, Red-on-buff bowls commonly had a geometric band design below and parallel to the rim. Still more characteristically the inside of these bowls was often smudged to a dark gray or black color, which gives the appearance of a red-on-black pottery. To the east, in the mountain region, the section with which the Salado people may be associated, compounds more nearly approach the conventional pueblo, and the walls are made of boulder masonry instead of puddled adobe.

Such regional variation, although it has not been stressed, is apparent in the culture of the Hohokam almost from its known inception in the Gila drainage. This has made it possible for workers at Gila Pueblo to set up several phases as subdivisions of the general culture. Too little is known in detail concerning most of these to discuss them very fully, and it has been felt that the student would be more confused than aided by such detail.

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Chapter XIII

SUMMARY OF HOHOKAM CULTURE

From the foregoing chapters it is apparent that the Hohokam people developed a culture which was both distinctive and exceptionally rich, particularly in the arts. Living in an extreme desert area, they not only successfully combatted adverse climatic and natural conditions, but sufficiently surpassed the needs of everyday life to produce many of the surplus joys and pleasures which mark the attainment of a higher culture. The development of agriculture on a scale which made possible experimentation in fields other than for provision of food was primarily dependent on irrigation. However, once irrigation ditches were established and fields had been put under cultivation, the creation of an adequate food supply was a relatively simple matter. The Hopi Indians today, living in an area almost as formidable, and with little or no irrigation, find it no great task to produce an agricultural living, actually spending only a very small part of their total working time in such pursuits.

It is surprising that more evidence of agricultural products has not been found charred in the sites of this culture. Such populous settlements as these could not possibly have relied to any extent on products of the chase, and apparently the only domesticated animal was the dog. Corn, squash, and beans probably formed the main vegetable diet, with corn serving as the staple. Cotton was also raised, and apparently was used widely in the production of fine fabrics.

Although a very intensive search has now been in progress for some years in an effort to determine the origin of the Hohokam, their beginning still remains uncertain, unless the work in a cave west of Tucson being done by the University of Arizona is found to fill this requirement. Gladwin has suggested that the stone artifacts show a gradual development from Cochise Culture to early Mogollon. Likewise early Hohokam Culture gives many suggestions of what little is now known of early

Mogollon Culture, and Gladwin has predicted that the two will be found to have a very similar evolution. We have several times suggested that earliest Hohokam was probably a regional variation of Mogollon. Should all these theories eventually be borne out it will be found that a series from very early Cochise Culture, through Mogollon, or a culture common to both Mogollon and Hohokam, to Hohokam was the history of these people. Most recent data collected by the staff of Gila Pueblo would seem to bear this out.

At present, the earliest well-understood evidence of Hohokam is the Pioneer, the first phase of which is the Vahki. It must not be forgotten that the total thus far reported evidence for the culture of this stage comes from only one site, Snaketown. Three other phases have been found to characterize this period, the Estrella, Sweetwater, and Snake-town. Haury has suggested an exceptionally long duration for the Pioneer Period, placing its beginning at about 300 B.C. and its end at A.D. 500, or suggesting that it lasted for some eight hundred years. Certainly culture change throughout this time was very great, but it suggests a people adapting themselves to a new environment rather than an exceptionally long indigenous evolution. For that reason the beginning date has been modified to about the time of Christ.

Should the earlier date prove to be correct it is possible that this culture represents about the highest development of a people now known in America at that time, and in some respects perhaps it surpassed that of western Europe. It cannot be doubted that the Hohokam at about the end of the Pioneer Period, or perhaps slightly later, began to exert an influence on other groups. Such a virile culture would be expected to have had a strong shaping influence on other groups in the Southwest, as it apparently had both to the north and west of the central Gila Basin area.

The accompanying table (Fig. 64) is a correlation of the various phases and stages of culture of the Hohokam with the periods set up earlier in this book. It will be noted that in some respects these do not directly correlate. The two Pioneer Periods definitely fail to do so, but many of the others show a much better time relationship. The Sedentary Period of the Hohokam and the Dissemination Period are closely correlated. It is interesting to note that in the desert area and the plateau at this time culture reached a high general level. That of the plateau apparently rose quite suddenly, whereas that of the desert section had a more gradual evolution.

The following paragraphs very briefly review some of the most outstanding traits of Hohokam Culture.

The Pioneer Stage begins with a very fine undecorated pottery but no decorated types, although some rather ornate and highly standardized styles of decoration soon evolved. Pottery forms show a considerable

variation but lack the eccentric shapes and marked characteristics of later times. Scoring as a form of decoration occurs more or less commonly and was often painted over with a design. Colors are red, gray, and red-on-buff or gray. Human figurines occur, the earliest being very crude generalized forms, the later with more definitely standardized features and with a much better style of execution.

PERIOD	HOHOKAM	PERIODS	DATES
			1350 A.D.
CLASSIC	CIVANO	CLASSIC	1200
	SOHO		1100
SEDENTARY	SANTAN	DISSEMINATION	1000
	SACATON		900
COLONIAL	SANTA CRUZ	ADJUSTMENT	700
	GILA BUTTE	SETTLEMENT	500
	SLAKE TOWN		300
PIONEER	SWEETWATER	PIONEER	100
	ESTRELLA		100 B.C.
	VAHKI		300
		HUNTER ↓	

FIG. 64. Table correlating the Hohokam periods and phases with those periods set up as a basis of discussion in the early portion of this book. The left column lists the Hohokam periods, the second column the Hohokam phases as correlated with the dates suggested by Haury. The third column is the series of periods, with their names and corresponding dates, that are applicable to the Hohokam series as now known. It will be noted that both ends of this latter series of periods have been omitted.

entrance, and somewhat rounded ends. This type is very similar to the Colonial type house. Cremation was being practiced, in which the bones and offerings were placed in trenches in the caliche subsoil. The metate is of a rather shallow basin type with a rectangular mano with rounded ends. Paint palettes begin their evolution from the first flat slab form to the more or less rectangular raised-rim type, but with no decoration. Stone axes appear late and are characterized by a raised ridge on both sides of the groove. Early point types are large and rather crudely flaked by percussion, with little pressure retouch. Later side notches appeared on more accurately made points with pressure flaking.

At the beginning of this culture stage houses were very large, suggesting those of the plains. They were pithouses, essentially square with rounded corners and a sloping entrance-way. During the various phases they became smaller, and at the end they were long in comparison to their width, had a two-post roof support, sloping entrance,

Jewelry is of some interest, for stone, shell, and bone were all worked. Carving did not appear to any extent, either on the stone bowls or shell. Bracelets of shell were slender and delicate, and pendants of shell and stone were made. Turquoise was used, sometimes as inlay material, more often as pendants.

The Colonial Stage shows many remarkable advances. A very large area was occupied at this time, A.D. 500 to 900, by a great many villages. Pottery shows a greater variation of forms, with an incipient Gila shoulder. Eccentric forms are illustrated by legged vessels, boxes, and heavy-walled vessels. The flaring-rim bowl is characteristic, with incised lines on the outside. Designs commonly consist of small repeated elements, and red-on-buff pottery is relatively abundant. Human figurines are better made, both heads and torsos still occurring. The coffee-bean eye is distinctive, as is the incised eyebrow.

Houses are much more definitely standardized, with a two-post roof support, a long rectangular form with rounded corners, and a side entrance. They are relatively smaller than Pioneer Stage houses, and shallow. Ball courts made their appearance, being very large, having parallel sides and low ridges marking the end zones. Irrigation also got its serious start with the construction of many narrow ditches.

The physical type, as is true of all definite Hohokam, is unknown, for the bodies were cremated. Collected bones and artifacts were now buried in shallow individual pits in the caliche subsoil. Many fine art objects have been recovered from cremations.

The metate appears to have been a long and slender trough type, and the mano is a rectangular block. Slate palettes were definitely evolved from the metatelite types of the preceding stage. They are rectangular with raised incised rims, often having a carved decoration at the ends. Stone vessels are now highly ornamented, both with incised geometric patterns and in raised life forms. It was now that carving of all sorts was most marked. Inlaid stone mirrors were made, showing one of the most typically Mexican traits. Stone axes were still of the three-quarter-groove type, but were shorter and lacked the rim bordering the groove.

Chipped stone points were very much improved in technique. The most characteristic form was the relatively long and slender point with marked serrations or barbs along the lower two-thirds of the blade. Some had lateral notches and concave bases, but most had small necks only, or corner diagonal notches. Both obsidian and chert were used.

It was probably in shell carving that these people excelled. A variety of forms are known to have been made, the most ornately elaborate

being bracelets. These have both cutout and relief designs, some of which are animal and some purely geometric. One bracelet found at the Grewe site is very strongly suggestive of the plumed-serpent motif of Mexico. Several traits show parallels with Mexico, the legged vessels, figurines with coffee-bean eyes, mirrors, and shell carving (as regards designs) all being good examples.

Although it is possible to subdivide the Colonial Stage into its two phases, the Gila Butte and Santa Cruz, and to correlate them with the periods arbitrarily set up as a basis for discussion, this has not been attempted beyond pointing out certain of the most basic distinctions in artifacts. From the material discussed in the Colonial chapter, it would be possible for such a separation to be made and correlated with the Settlement and Adjustment Periods. This is particularly applicable to pottery, figurines, arrow points, shell carving, and irrigation ditches. However, the obvious greater unity of these two phases, as compared to other phases, would set them together rather than apart, and they have been so considered.

Sedentary Culture occupied an area smaller than that of the Colonial, though centering in about the same general region. Pottery shapes are distinctive, largely in more extremes of both size and shape. The Gila shoulder is most marked, often being so exaggerated that the vessel seems almost to have a flat base. Both bowls and jars are exceptionally large, the jars occasionally approaching thirty gallons in capacity. Designs are distinctive, characteristically having patterns like cloth fabric. These occur in panels and, though they contain some scrolls, are essentially geometric. Hatching and interlocked frets are characteristic. Human figurines consist solely of heads and are much more lifelike than previous types.

The house is very characteristic, being of a long oval form with definitely rounded ends, two-post roof support, and an entrance which contains a step. In all it is better made than the Colonial type. Ball courts are of the smaller oval or "Casa Grande type," with restricted end features. This type probably survived to almost as late as A.D. 1400 in the Gila. Irrigation ditches were abundant and very characteristic.

Many of the artifacts of the preceding stage carried over with little or no change. Stone axes are similar, though perhaps tending to be longer and more slender. The metate and mano are similar but not quite so long and slender. Stone palettes and stone bowls, although present, decline both in number and workmanship. Stone mirrors appear to have

been absent at this time. Arrow points, like pottery, show extreme forms. Some of the characteristically long and slender points have accentuated serrations to the point of large barbs. Blades are even longer and more slender than previously. The lateral notched type seems to have been very common.

Shell ornaments are not only carved but also etched with an acid to give relief figures. This is a new technique and appears to have been short lived. Carved shell bracelets seem heavier than earlier types, and even more ornate, although the preceding fine shell carving has passed.



A general view of the foothills of the mountains in the desert area. It was here that a supply of water from the mountain-fed streams made human occupation possible away from the main permanent streams such as the Gila and Salt.

Cast-copper bells of native copper have been found in this culture. They are made by a method identical to that used in Mexico but do not appear to have been made there. Perhaps this is the earliest evidence of copper bells from the Southwest.

Almost at the end of the culture stage houses seem to have begun to emerge from the ground and to have been combined into a suggestion of a compound structure. These may have resulted from casual contact with the arriving Salado people to the north and east. A new and distinctive red pottery type would further suggest such a contact.

Classic Culture is more difficult to characterize, for much of the culture of this time is blurred by the presence of Salado traits. Cremation was still practiced and the bones deposited in bowls, or other containers, much like some cremations of the Sedentary Stage. In fact much of the culture of the early part of this period appears to have been a continuation of the latter part of the Sedentary.

The area of greatest concentration is considerably reduced from that of the preceding. Pottery forms are distinctive because of two features. The necks of jars are tall and straight, as compared to the low and sharply returned necks of Sedentary types; and in the red types, lifelike forms are common. Both a bright red slipped pottery and red-on-buff types were made. Designs appear distinctive largely because of the greater use of negative painting, a feature which at about this time was enjoying considerable popularity in the northern part of the state. They are mostly geometric and still suggest fabric arrangements.

Houses which are known to have been Hohokam were now surface structures of not more than one story. The walls were thin and of clay, often reinforced with vertical poles, tied together with finer material. A form of compound was apparently well established, with a definite more or less rectangular surrounding wall. Ball courts of the smaller type survived, and irrigation appears to have reached about its height. Stone artifacts and other material traits carried over in much the same form as in the preceding stage, with possibly a decline in abundance and excellence of some objects. A good example would be shell carving. Inlay and certain other types of ornaments seem to have been even better than previously, but on the whole there was a decrease in skill of workmanship in such objects.

Probably the most striking feature of this time was the undoubted commingling of Hohokam and Salado people. All evidence indicates that they lived together in the same villages on the most amiable terms. Salado traits were multi-storied houses with great adobe walls, compounds, polychrome pottery, and inhumation. Cremated burials which contain one pot each of Red-on-buff and Polychrome pottery are occasionally found.

The end of the Hohokam has been the subject of much speculation. Their culture seems to have dwindled and disappeared sometime near A.D. 1400. Gladwin is inclined to feel that they may have lasted into present-day Pimas, but if they have, their culture has altered in certain particulars and lost many definite features. Possibly they either died off

or were absorbed by other groups. The writer cannot help feeling that there is some evidence of a slight population shift to the east before their passing in the Gila proper.

Figure 65 is an effort to evaluate this culture further by comparing the development of several important Hohokam traits. It will be noted

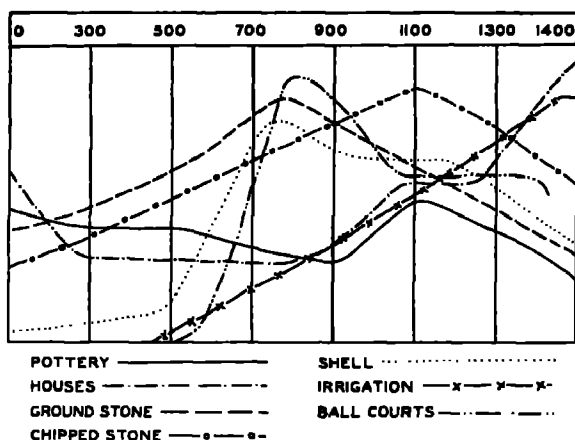


FIG. 65. Chart illustrating in the most general possible manner the relative development in time of several important Hohokam traits. Much criticism might be made of this method of presentation of such comparative data on the grounds that it is colored by individual choice. It is useful in pointing out the periods of greatest change in a culture. There are two periods of marked cultural evolution represented, one in the Colonial Period and another during the Sedentary. Only two traits were greatly influenced to rise towards the end of the Hohokam Culture. These are houses and irrigation.

that irrigation was started at about the end of the Pioneer, much earlier than actual ditches were found at Snaketown. It is reasonable to believe that some sort of casual irrigation must have been practiced before the construction of actual systems. Perhaps this was simply flood diversion of waters through short ditches. The line indicating ball courts has not been carried quite to A.D. 1400, for although the courts may have lasted to this date they certainly did not last beyond it as definite structures. Many features such as this have led the writer to feel that Hohokam Culture as such probably did not last later than about A.D. 1350.

Although certain artifacts reached very high individual levels at various times and then dropped, the highest level of all the traits considered was reached sometime during the eleventh century. This fell in the

Sedentary Stage just previous to the time of arrival of the Salado people. Carving of all sorts reached its peak in the Colonial, probably in the ninth century, and strangely enough the largest ball courts are to be found associated with the most insignificant houses. Pottery, too, had an interesting development, starting with some very fine and highly developed plain types it gradually sank to a rather low level, only to rise again sometime near A.D. 1100. This upturn may possibly be ascribed to influence from the Saladoans. Soon after it seems again to have decreased in excellence until its disappearance about A.D. 1400. Houses started out large and imposing, declined somewhat to a simple pithouse level, remained about the same to Sedentary Culture when they were a little better made, and then just previous to 1300 made a sharp rise with the introduction of the compound and surface structures. Other traits are so simple in their development as not to warrant detailed consideration.

Chapter XIV

MOGOLLON CULTURE

The Mogollon has been repeatedly referred to in preceding chapters as an early, basic, and virile culture which modified various groups throughout the Southwest. At the present time influences of this culture on other groups are traceable largely through pottery and house traditions. This, however, is not so much an indication of the absence of other influence as our lack of specific knowledge concerning many of the minor characteristics of true Mogollon Culture.

Data suggesting the early occurrence of Mogollon are found in the stone typology, which it is believed may be traced from the early Cochise Culture to Mogollon artifacts. A plain red pottery which is found upon careful analysis to have been manufactured in the Mogollon area, and which occurs in the earliest levels at Snaketown, would also indicate some antiquity. Last, in northern Arizona, pottery found near Flagstaff, named Rio de Flag Brown, shows such detailed similarities to Alma Plain, a Mogollon type, that some relationship cannot be denied. This type has been dated as before A.D. 700 in the northern area.

The extent of influence of this culture may perhaps be more distinctly shown. Mogollon characters which made themselves felt on the Hohokam are indicated by the presence of certain red pottery types in the early horizons at Snaketown. To the north, strong Mogollon influence may be traced through Kiatuthlanna to Chaco Canyon, where pottery types again suggest this culture. To the northwest in the vicinity of Flagstaff both houses and pottery types show many Mogollon traits. Even at an earlier date, sometime prior to A.D. 700, such pottery and house traditions may be seen in the eastern San Juan area, where Basket Maker Culture was apparently coming under a strong Mogollon influence.

From this it is apparent that Mogollon exerted both an early and widespread cultural influence, and since this is true it must have been *more than usually vigorous*. From influences previously noted by archaeologists on other cultures it was predicted long before Mogollon was

found that some such group would eventually be uncovered. For this reason, and because it showed several of the traits which had been recognized as foreign to the cultures with which these archaeologists had been dealing, Mogollon was quickly accepted as filling a long-felt need. With more mature consideration it is found that many hoped-for traits are

lacking from the sites thus far excavated, and so it is likely that the true, early, basic Mogollon is still to be discovered and reported.

The accompanying map is an effort to indicate the region of now known greatest concentration and maximum dispersion of this culture. However, it must be recalled that no effort has been made here to separate early and late sites into their respective areas, but simply to indicate the distribution of sites which show strong Mogollon character. It will be immediately noted that the area occupied

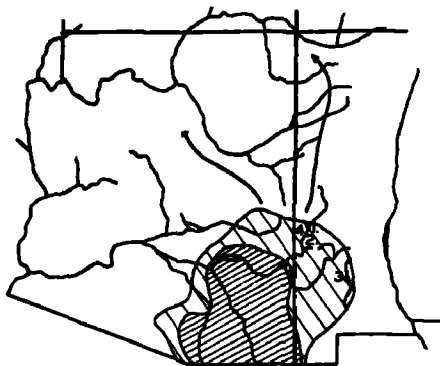


FIG. 66. Area occupied by the people of Mogollon Culture. Section of fine hatching is that region of the densest population; coarse hatching, extent of group. Arrows indicate known direction of influence of this culture to north and west. 1 is location of the Starkweather ruin. 2, Mogollon village. 3, The Harris village. 4, The SU site.

lies in southeastern Arizona and extends only slightly into southwestern New Mexico. The upper portion of the Gila River and its tributaries seem to have been the center with an extension down the San Pedro and Santa Cruz Rivers. The basic data for this map have been taken from the *Medallion Papers* of Gila Pueblo.

Although the area of concentration does not lie directly within the section which has been designated as the mountain portion of the Southwest, there is a good deal about this culture which leads one to feel that it is primarily a mountain group. Haury has indicated the economy to be about equally divided between hunting and agriculture, a situation which requires a mountainous, forested or brushy country. On the map the direction of spread to the north and west has been indicated by heavy lines and arrows, and this is found to have been principally through more or less mountainous country.

At the present time only four sites of this culture have been dug and

reported. Haury was the first to excavate, having dug the Mogollon and Harris villages and identified Mogollon Culture on the basis of them. These are represented on the map respectively by numbers 2 and 3. More recently Nesbitt has excavated the Starkweather ruin a few miles north of the Mogollon village. The approximate location is shown by number 1. See Fig. 66. Most recently Martin has dug and reported the SU site, number 4.

It may be readily seen that all these sites lie outside and to the east of the main portion of the area believed to have been principally the home of the Mogollon people. Thus they are geographically peripheral to the main area of Mogollon occupation and may also be expected to be somewhat peripheral in culture. All these sites, also, lie on a line which later showed marked Pueblo influence, and it is not impossible that they may have reflected both Basket Maker and Pueblo characters at even an earlier period than might ordinarily be expected. All this is mentioned here simply to indicate that what we now know of Mogollon may not be truly typical of this culture in the sense of the center.

Absolute evidence of early dates has not been found in any of the sites. Haury was able to secure several tree-ring dates from the Mogollon village, all of which grouped very near A.D. 900. Nesbitt also secured a few beams from the Starkweather site which were later dated, and these fell at the same time. However, on a purely culture-change basis, Haury was able to establish three definite phases into which the Mogollon represented at these sites could be divided. See Fig. 67. The first of these he calls Georgetown; the second, San Francisco; the third, Three Circle; and following this, but of Mimbres Culture, comes the Classic Mimbres Phase.

As for Snaketown, he has suggested approximate dates for these phases by allowing two-hundred-year periods for each phase above and below the secured date of A.D. 900. Criticism has already been made of this method, but in the absence of any more convincing data it may be taken as an indication of their time and duration. In his work at Starkweather ruin, Nesbitt found the same phase sequence, although in some charac-

		MOGOLLON VILLAGE	HARRIS VILLAGE
CLASSIC MIMBRES	1100		
THREE CIRCLE	900		
SAN FRANCISCO	700		
GEORGETOWN	500		

FIG. 67. Figure indicating the three important Mogollon phases with relative dates, and an indication of the duration of Mogollon and Harris villages. The only absolute dates are those near A.D. 900; the rest are estimates.

ters, particularly houses, he is inclined to divide the San Francisco into an early and late manifestation, and at the SU site Martin found what is certainly an earlier phase.

From this it is possible to correlate the Georgetown Phase roughly with the Settlement Period. This would also cover the time at which Basket Maker III Culture was flourishing in the plateau, and in fact there are many suggestions of cultural similarity between the two groups. In the Hohokam area it would represent the first half of the Colonial Stage. The San Francisco Phase is apparently well represented at all sites and might be correlated with the Adjustment Period. The culture of the plateau at this time was essentially Pueblo I, and that of the desert was the latter half of the Colonial Stage. Three Circle would correlate with the Dissemination Period and would include Pueblo II or III in the plateau and the Sedentary Stage of the desert.

Because of the lack of detailed information concerning this culture, particularly of the earliest part and the center of the area, no serious attempt will be made to discuss the various phases represented. Except for house and pottery types, artifacts will be lumped to give a concept of the general culture as a whole rather than the detailed cultures as found at various specific times. As additional work is done here it will be possible to correlate culture more definitely with time.

Pottery types found to be typical of Mogollon Culture are San Francisco Red, Mogollon Red-on-brown, Three Circle Red-on-white, Alma Plain, textured types such as Alma Punched, Neck Banded, Incised, and Scored, and Mimbres Bold Face Black-on-white. Two new types temporarily named Unpolished Brown and Polished Red have been reported from the SU site by Rinaldo. Unpolished Brown is similar and probably ancestral to Alma Plain, but is thick, undecorated, never so well finished, and has coarser temper. Most common forms are hemispherical bowls and globular jars without necks. Polished Red is suggestive of, and perhaps ancestral to, San Francisco Red; it is also undecorated but has coarser paste and a less well-finished surface. It occurs most commonly as narrow mouth jars and shallow bowls.

San Francisco Red occurs in all phases. Mogollon Red-on-brown is from all phases but is most abundant during the San Francisco phase. Three Circle Black-on-white is found in all phases but most abundantly in the San Francisco. Alma Plain is by far the most common type throughout all phases. The textured types occur in all phases but most abundantly in the Three Circle; and Mimbres Bold Face Black-on-

white is confined mostly to the Three Circle. All these types were found to be definitely allied except Mimbres Bold Face, which never occurred in houses or rubbish mounds in association with Mogollon Red-on-brown.

San Francisco Red is of particular interest because it appears to have been a type very basic to the Southwest. The paste has a core which is gray to brown and includes whitish angular particles as temper. The interiors are slipped and tool polished, occasionally showing the marks of scraping through the slip. The exteriors are smoothed or finger dented, sometimes coiled or showing scoring as though with grass stems. The color of the slip is brown to a rich red. Forms are bowls, both shallow with outcurved sides and in later periods deeper forms (see Fig. 68), and small round-bodied jars. Rarely seed jar forms occur.

Alma Plain is by far the most abundant type and forms most of the common culinary vessels. The paste is coarse and brown, with rarely a gray core, and contains coarse heavy temper of heterogeneous material. The surface is unslipped

but often rubbed down with a tool. Interiors are poorly finished and rarely smudged black. The surface color is buff through gray to red-brown. Appliqué designs are uncommon but sometimes present. Shapes are bowls with rounded rims and jars with both large and small mouths. Seed bowls are rare, and legged vessels are indicated only by the presence of legs. Jars far outnumber bowls.

Mogollon Red-on-brown, though rare, is probably the most characteristic Mogollon type with a painted decoration. The paste is light gray to reddish brown, and temper is white angular particles and quartz. Interiors are both unslipped and slipped. When a slip is used it is so poor that the scrape marks of finishing show through. The slip is from a somewhat pinkish to brown color. Exteriors are slightly finger in-



FIG. 68. Mogollon pottery forms and designs. Bowls, seed jars, and jars are all shown as well as the rare handled pitcher. Design shown at the left is from Mogollon Red-on-brown; that to the right, Three Circle Red-on-white.

dented so that they have a large dimpled effect, are polished, and show tool strokes parallel to the rim. Fire clouds are not uncommon. Decoration is in a reddish brown pigment which was polished over before firing, so that the edges of the lines are slightly blurred into the background color of the slip. Designs cover the insides of bowls, all but the insides of jars, and are of purely rectilinear types.

Three Circle Red-on-white appears to be more or less contemporaneous with Mogollon Red-on-brown. The paste is dark to light brown, and the temper is heterogeneous fine material with only a few larger



Such large canyons as these dissecting the southern edge of the plateau were occupied by Pueblo IV sites.

particles. The surface is scraped and then slipped with a chalky white slip, which sometimes crackles to form many fine crossing lines. Bowl exteriors are only roughly finished, a few having a reddish brown slip or more rarely corrugations. Forms are both bowls and jars. Bowls have flaring rims or are the deep hemispherical type, but occur only in about the proportion of six to one jar. Decorations are in the same red-brown paint as Mogollon Red-on-brown, a few being blurred by polishing before firing, the rest not. Designs are carried to the rim. This type apparently enjoyed only a short life and was never very plentiful. It probably

is an intermediate form, relating the Red-on-brown to the Black-on-white types of the Mimbres Culture.

Designs of both Mogollon Red-on-brown and Three Circle Red-on-white are composed primarily of coarse lines and massed areas of color with serrated edges. All the design elements are rectilinear, and the area upon which the design is applied is characteristically divided into four equal sections, on the bowls by drawing a cross through the center of the vessel. This quadrilateral division of design is also characteristic of other types in the plateau and Upper Gila and Salt areas at slightly later times.

Mimbres Bold Face Black-on-white is a later type which was probably influenced in its evolution by Pueblo Culture from the north. The paste is gray; and the temper is coarse, angular, and predominantly soft, although some quartz is found. The interiors of bowls are well smoothed and have a chalky white polished slip, while exteriors have no slip and are gray to brown in color. Decoration varies between black and a chocolate-brown, depending on the method of firing. Execution of design is better than in preceding types, and new elements are introduced, particularly scrolls and wavy hatching lines. Shapes are bowls, jars, seed bowls, and pitchers. This type precedes Mimbres Classic Black-on-white, but Haury feels that it is a successor of the Mogollon series.

Textured types are all variants of Alma Plain with added decorative elements. They do not occur in any great abundance and, although scattered throughout all the phases, are most common in the last. Variations are scored, apparently with coarse grass stems, incised usually in parallel lines with a blunt point, punched (a small implement being used to make indentations in the surface), and neck banded, the upper portion of the neck containing parallel flattened bands of clay.

Houses have been found to form a typological series assignable to phases perhaps even more distinctly than pottery types. In all this area,

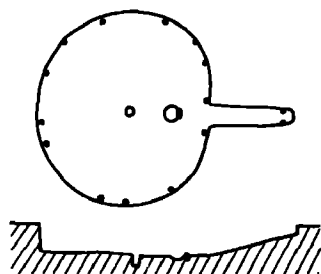


FIG. 69. Circular pithouse most typical of the Georgetown Phase. All are relatively deep structures with central support posts and peripheral posts in the floor. A firepit is about midway between the entrance opening and the center post. Entrances are long and sloping from the floor to the surface of the ground.

circular houses precede rectangular, a situation which finds a parallel in the archaeological history of the plateau. The earliest houses, those reported at the SU site, were round with an entrance passage on the east side. They were quite large, but not particularly deep in relation to their diameter. In the floors of all houses pits of various size and depths were found containing burned bones and stones. Possibly they were used for cooking. A few firepits were also found but showed little use. The roof was supported by posts, generally four, which were set out from the walls.

All the Georgetown Phase houses are circular and relatively deep. Haury reports some as much as twenty-four feet in diameter, although the average is much smaller. He found that a typical house has a central support post with smaller posts set around the periphery of the floor. The firepit is located between the central post and the opening of the long sloping entranceway which leads from the floor to the surface of the ground. The walls are plastered clay, and the roof is assumed to be clay covered and slightly peaked. Of the same period Nesbitt reports circular pithouses three to four and a half feet deep. He found both a type similar to that reported by Haury and a second type in which four posts placed near the walls are the roof support. Some of the entrances of these structures are quite narrow and steep, thus strongly suggesting ventilators.

Characteristic of the San Francisco Phase Haury found rectangular houses with rounded corners which were twelve to eighteen feet long and relatively deep. In this type there was a central post with additional posts near or on the walls. In some houses two secondary support posts were located on the central line. A definite firepit was still in the same relative location, and a long sloping entrance was located on one of the long sides. Nesbitt found circular pithouses early in this phase which had a four-post roof support and a roof entrance. In this type neither a lateral entrance nor a ventilator was present. Later rectangular, shallower pithouses seem to have been more characteristic. These had a central post, four corner posts, and two additional posts on the long axis. A definite firepit was found in this type, as were cache pits within the house. This last feature was not found by Haury in either the Mogollon or Harris sites, although he did find distinctive undercut storage pits outside of the rooms. A sloping entrance on one of the long sides or in a corner of the room completed the features.

Three Circle Phase houses at the Harris village were rectangular

with more nearly square corners, and were shallower and smaller, being only eight to fifteen feet. Four corner posts were typical features, with a fifth post on the center line near the back wall. The well-formed firepit was located in front of the long entranceway and often had a rock built in its outer margin to act as a slight deflector of draft from the ground surface through this opening. The relative narrowness of some of these entrances suggests that they might have served as ventilators, although there is apparently no direct evidence of such a purpose. At Stark-

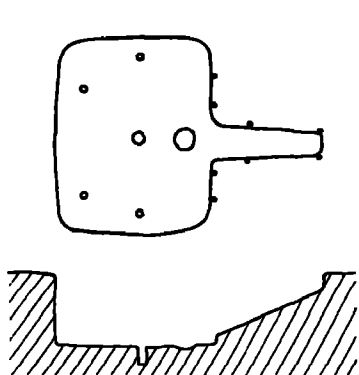


FIG. 70. San Francisco Phase house. These houses are rectangular with rounded corners and still have the large central post but also two others on the central line and supplementary posts as well. The entrance firepit arrangement remains much the same.

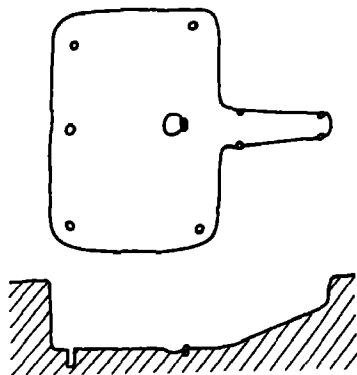


FIG. 71. Three Circle Phase house. This is more distinctly rectangular with nearly square corners. Four corner posts and one near the back wall are characteristic. The entrance and firepit are the same. Note rock placed in front edge of firepit which acts as a slight deflector to fresh-air drafts.

weather, circular pit structures, as much as thirty-seven feet in diameter and five and a half feet deep, were found. Part of the wall was of coursed masonry, but the rest was plastered clay. The lateral entranceway of this type contained a stepped terrace. Similar large surface structures found by Haury suggest the possibility that they had been used as some sort of a ceremonial structure, for only one or two were found in each village.

Surface houses appear to have reached this area about A.D. 1000 and to have replaced pithouses at that time. This is almost certainly an influence ascribable to the Pueblo people, who had evolved surface

masonry multi-roomed and multi-storied structures at least a hundred years before this date.

Although Haury reports a few cremations, the characteristic method of disposal of the dead was by inhumation. The bodies were flexed and buried in trash mounds, in storage pits, or in the open, but were found beneath the floors of houses only at Starkweather. Infants were occasionally buried under the floors of rooms in the other sites. Also at



A partly flexed inhumation uncovered by the Museum of Northern Arizona near Flagstaff. This is the Mogollon method of burial. In a more tightly flexed position the knees would be drawn up almost to the chin.

Starkweather extended burials of Mogollon Culture occurred, although there is a possibility that these may not be the remains of true Mogollon people.

The physical type has been a question of some interest, for Haury reports an examination made by Woodbury of the skeletal material found at Mogollon and Harris villages as quite distinctive. Woodbury has classed these people closer to a Caddoan group than to any other and has characterized them as having low vaults and undeformed round heads. Other individuals from these sites are of the general Pueblo type. Two adult males from the Starkweather ruin were found to be medium headed, or mesocephalic, and to have a medium vault. Nesbitt has suggested that they may possibly be intermediate between Basket Maker

and Pueblo types of the north, as they may well be. A series of burials reported from the SU site all were unlike the Woodbury type and very similar to the general Pueblo type as regards form, but were either not deformed posteriorly or only very slightly so. Certainly too little work has been done on the physical characteristics of these people to establish a definite physical type for them, but from the small amount of material measured to date they do not appear to have been similar to Basket Maker.

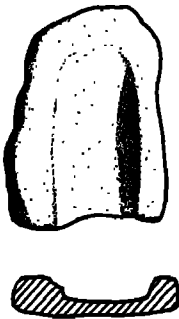


FIG. 72. Metate and mano types. Early metates are flat rocks with an oval depression in the center where grinding was done. Later types are troughed with only one end open as above. Early manos are circular as in the lower figure. Later forms are parallel sided and with rounded ends. Both are nearly flat on the under side.

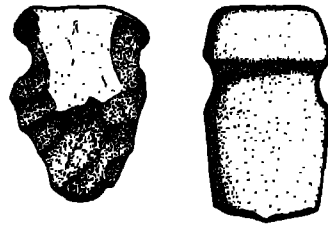
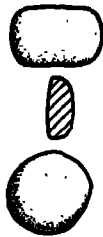


FIG. 73. All Mogollon stone axes are full grooved. The specimen on the left was found at the Harris site; that on the right, at the Starkweather ruin. The latter has been broken and blunted through pounding.

In all sites two types of metates have been found. The first, assignable to the Georgetown Phase, is a more or less unshaped block of basalt with a flat upper surface and an oval depressed grinding area. This has often been mentioned as belonging to the Basket Maker Culture of the plateau. Round or oval grinding stones are associated with this type. Later an equally distinctive metate appeared, with a long trough-shaped grinding surface, which is closed at one end and open at the other. The only other area in the Southwest known to the writer where these are the only common type is that of the Patayan Culture to the west of Flagstaff. Manos associated with this type are parallel sided but with rounded ends and a nearly flat grinding surface.

Relatively few axes have been found in any of these sites, but all have been of the full-grooved type. Haury found two crudely flaked examples of diorite at the Harris site. Although he assumed that these were not typical they show notches on their sides and suggest the better-made examples from the Starkweather ruin. At this latter site three ground axes, all with full grooves, were found. The full-grooved axe has been assumed to be an early Pueblo character, but because of the presence of this type in Mogollon sites it appears equally possible that it was introduced from this culture to the late Basket Makers.

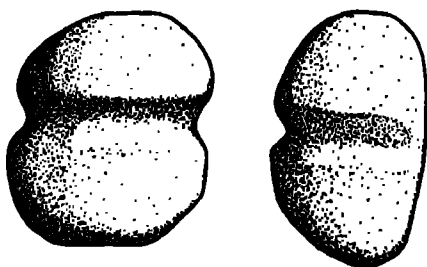


FIG. 74. Mauls are of two types. The left more rounded form with a full hafting groove appears to have been the earliest. The right three-quarter-grooved form is later. Mauls are relatively abundant in sites of the Mogollon Culture.

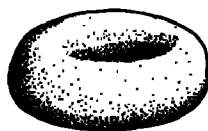


FIG. 75. Stone bowls are not well made, seldom decorated with scratched designs, and though not abundant seem to be typical. The type illustrated is the most common.

Mauls are also of two types. The earliest form is ball shaped and has a full groove. The later type, which extends into the Pueblo Culture at these sites and in this area, is longer and has a three-quarter groove. It is surprising to find three-quarter-groove mauls occurring at a time apparently earlier than such axes in this culture, but they appear to be well established. It is equally surprising to find an inferior type of full-grooved axe surviving into a time when fine three-quarter axes were well established in Hohokam Culture just to the west.

Rather crudely made stone bowls were found in all the sites. Some few had incised lineal designs, but decoration appears to be rare. As compared to stone bowls known from the Hohokam at a comparable time they are far inferior. Like axes they are not numerous in this culture.

Flaked implements constitute one of the most interesting classes of

objects. They fall into three general groups. Finely pressure-flaked points with convex bases and diagonal side notches appear to have been typical in Mogollon and Harris sites. They are rather broad and bluntly pointed in shape. Cruder forms, mostly made by percussion flaking, were found at both these sites and were the only type from Starkweather. These are slightly larger, suggesting that they might have served as atlatl dart points rather than arrow points. They are notched, sometimes with diagonal side notches or with straight lateral notches, and have either straight or convex bases.



FIG. 76. The most common chipped stone point is that to the left. It is short and wide with diagonal notches. The next form is a winged drill which is common to all sites. The third point is heavier and not so well chipped and may be an atlatl point. That to the right with serrated edges was found only at the Harris site.

At the Harris site Haury found a longer and more slender point type with definite serrations on the edges. These are not so well made as the long slender points of the Hohokam, but the general shape and the presence of serrations suggest some affiliation. The last type of point is represented by the presence of several stone drills. These have long slender shafts which in cross section are diamond shaped. The head has flaring wings so that the drill might be gripped in the fingers. This particular type is of interest in that it does not appear to be Southwestern. The closest affiliation is probably with the Mississippi valley or the western plains, where almost exact duplicates occur in some abundance. Drills from other cultures in the Southwest are largely stone splinters, which were set into handles, or sticks. It is in the general appearance of the flaked tools that Mogollon seems to show affiliations to the eastward rather than to the west.

At the Harris village Haury found one small fragment of charred basketry. It was of the two-rod-and-bundle type with interlocking but not split stitches. This sort of basket is commonly found in the Basket Maker Culture to the north. Heavily matted fragments of fabrics were also found, but the poor preservation made it impossible to determine weaves. In all cultures both basketry and matting were apparently known in some form, although in open sites such material is not often preserved. No data were secured on sandal types.

Although it is not discussed in any of the reports, Haury lists worked copper as belonging to the San Francisco Phase.

Hunting implements may only be inferred from the stone artifacts already described and from the nature of the animal bones found. Probably both the atlatl and the bow and arrow were known to these people. The former is indicated by the finding of what appears to have been an atlatl weight, as well as the already mentioned large and coarsely flaked points. The arrow is indicated by the presence of smaller and more delicately flaked projectile points. That these people were excellent hunters is shown by the fact that they killed and used such animals as bear and bison, an undertaking which required real prowess.

Animal foods include a long list, bison, bear, deer, turkeys, all small animals, and many birds being used. It is because of the abundance of such large animals that Haury is inclined to place their economy as about equally divided between hunting and agriculture. Of vegetal foods only corn was found, no evidence of beans or squash having been uncovered. Agricultural practice, at least by San Francisco Phase, included the use of a broad flat stone blade. This is apparently in opposition to the typical digging and cultivating sticks of the Basket Maker and Pueblo people, but seems to have been the Hohokam implement.

Ornaments are not particularly abundant or striking. Some seed beads

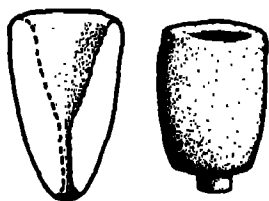


FIG. 77. Mogollon stone and clay pipes are of two types. That at the left was made in one piece, as is shown by the cross-sectional diagram. This type was found at Mogollon village. The one to the right is of two pieces, a bowl and stem of bone. It comes from the Harris and Starkweather sites.

appear to have been used, but the most common was shell. Olivella shells are by far the most abundant type, although a few bilobed flat beads cut from shell were found in all sites. Pendants of shell and ground-down slender glycymeris shell pendants or bracelets were relatively common. It is striking how widely this shell bracelet type was distributed throughout the Southwest in nearly every culture and most periods. Probably the most striking and perhaps the most original and characteristic feature of ornaments is the double-lobed shell bead, for other types are certainly not distinctive to this group. Pigments of several colors were found in all sites.

Pipes are of special interest, for they are all of the straight type, though they were made either of clay or stone. The long type, somewhat pointed at one end and without an additional stem, was perhaps the earliest and is very suggestive of Basket Maker pipes. The short cylindrical pipe was also a

Basket Maker type. This pipe had an auxiliary stem, usually of bone, which was fitted in and cemented to the base or mouth end. Most of the stone pipes seem to have been of the long tubular form. It will be recalled that pipes of any sort were noticeably absent from Hohokam Culture.

Three classes of bone objects were found to be common to this culture. Bone awls are of three general types. A few awls show a distinctive feature in the presence of a side notch (see Fig. 78). As they do not occur in other areas in sufficient abundance to be considered primary, it was probably a Mogollon character. Awls of this type are mostly made from split deer metatarsals. The second type was formed from the split metatarsal but without the notch, the blade simply being worked down to a point. The third type is formed from a splinter of bone. Besides awls, large tubular bone beads seem to have been a feature of this group. Although such tubes occur sporadically in other cultures they do not appear to have been so basic as here. Bone dice were also found, a feature which is very common to the Basket Maker Culture. Just what these small objects might have been used for remains problematical, but they strongly suggest use in one of the gambling games so dear to the heart of the American Indian.

Incised or punched baked-clay cornucopia-shaped objects are so typical of the Basket Makers that they will be discussed there. These were not abundant but did occur in Mogollon Culture of the earlier phases.

In summary the following features might be considered typically Mogollon. Although the area generally believed to have been occupied by this group does not appear to be directly within the mountain section, it is quite possible that this was primarily a mountain people, who occupied rugged, forested, or brushy regions. Pottery is a most distinctive feature, especially San Francisco Red, Alma Plain, which appears to be very basic and perhaps in general tradition very widespread, and the two decorated types, Mogollon Red-on-brown and Three Circle

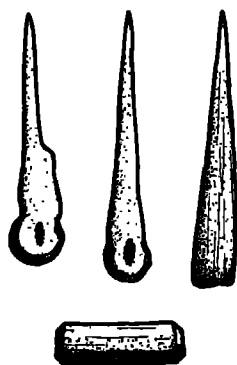


FIG. 78. The most distinctive bone implement is the notched bone awl as in the upper figure. The central illustration is of the straight-edge type, and at the right is a pointed splinter. Bone tubes were also found to be typical of this culture as shown in the bottom figure.

Red-on-white. Designs of the latter two are distinctive. The peculiar dimpled surface appearance of polished pottery in this culture is also apparently very characteristic and may have carried over in certain pottery types in other regions at later times.

Houses are pithouses, either circular or rectangular, and, except for the very earliest, are deep even in relation to their considerable size. A central roof support post is a distinctive feature, and long sloping entrances seem to have been a Mogollon trait. The troughed stone metate open only at one end is characteristic, as is the full-grooved axe. Neither of these finds abundant parallels in any other pure culture. Chipped stone points of the broad type with lateral notches, and side-notched bone awls and bone tubes all seem to be basically of this culture. At the present time double-lobed shell beads may be at least tentatively ascribed to these people.

Even from this it is apparent that, although relatively little detailed work has been done on this culture, it forms a very distinctive group. Gladwin has suggested that further research may reveal a very close similarity in the evolution of Mogollon and Hohokam. This is quite likely true, particularly if it is found that the suggestion, already repeatedly made, that Mogollon formed the basis and guiding force in the early evolution of Hohokam Culture, is correct.

Haury has given an excellent evaluation of this culture in his paper. Here he points out that the economy was about equally divided between hunting and agriculture, both the bow and atlatl appear to have been in use, possible ceremonial chambers are present, and all pottery is oxidized, coiled, and extensively polished. From this Haury has made clear that early Mogollon is closer to Basket Maker than to either Hohokam or Pueblo Culture.

Probably Mogollon was an early cultural manifestation in the Southwest. In many characters it suggests some influence from or parallelism with Plains or Mississippi Valley Culture, and in others shows what may have been a typological evolution from Cochise Culture. That it had strong basic influences on surrounding areas cannot be denied. Probably it served as the basis of early Hohokam, and the writer is convinced that it had a large part in the change which took place from Basket Maker to Pueblo. Strong influences apparently spread out from Mogollon to other people at very early times, in the north once prior to A.D. 700 and again probably at about A.D. 1000. At this latter date strong Pueblo influence began to make itself felt on Mogollon, although prior to this

date an interchange of some ideas seems to have taken place. This culture then faded and blended with Pueblo to produce what now appears to have been Mimbres. Much fuller discussions of all these theories will be undertaken when Basket Maker, Pueblo, and Salado Cultures are considered in detail.

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Chapter XV

FOUNDER PERIOD A.D. 300-500

BASKET MAKER II CULTURE

The characteristics and outstanding cultures of two of the major physiographic areas of the Southwest have been discussed, and it is now time to examine the culture of the third area, the plateau. It is in this section that the earliest and most intensive archaeological work was done and about which the most complete reports have been written. As a result it will be possible to review certain aspects of these cultures more briefly, particularly of the later most completely reported periods. However, much of the literature appeared before terms and concepts now in use were standardized, so that it is necessary to define by description each culture and period. It is possible to correlate them with dates more definitely than in any other area, for it is here that by far the most dates have been secured.

The earliest culture definitely recognized in the plateau is the Basket Maker. The name, it will be recalled, was derived from the fact that early excavators noted that certain burials found in the caves did not contain pottery but had a good many very fine baskets. Since that time much work has been done on this culture by Cummings, Kidder, Guernsey, Morris, Roberts, and others. These men have succeeded in contributing sufficient information to give a clear picture of just what pure Basket Maker Culture was.

It will be recalled that when the Pecos classification was formulated one stage of culture was included which had not been recognized, with the idea of permitting further expansion of the classification into the past. This was called Basket Maker I and designated as a postulated pre-agricultural stage. Apparently no such culture has as yet been definitely found, unless the later stages of the Cochise Culture might be so considered, although E. B. Renaud, working in New Mexico, suggests that he may have uncovered some clues of it. In slight shelters formed within fumeroles he found evidences of old campfires but no indications of true

agriculture. This he calls the Fumerole Culture. Later it seems to have developed into an agricultural group, for there were occasional crude metates. The antiquity of such slight evidences as were found remains somewhat questionable, for later groups may have left in their campsites only what appears to be of this culture level.

If Basket Maker I remains elusive Basket Maker II is certainly well understood. As it is now seen this stage is one of the most if not the most



Massive sandstone beds in various parts of the plateau are often cut by canyons with vertical walls such as those shown in this mountain range in northeastern Arizona. Overhanging caves formed in the side walls of the canyons have been shelters to all the people occupying this section in prehistoric time.

distinctive of the entire Southwest. It is very complete in certain lines of endeavor and does not show any definite development from any known earlier cultures. If the relationships suggested throughout this book may be accepted it is the only true Basket Maker Culture represented, for by the latter part of the next, or Settlement Period, it had received considerable influence from outside.

The best dates come from the four corners district where Morris has succeeded in securing a series of datable beams. (See chapter on tree-ring dating.) The greatest difficulty has arisen in the problem of cor-

relating dates and culture once they have been established, for these people, as will soon be shown, did not build houses. The assignment of a two-hundred-year period, beginning at A.D. 300 and ending at 500, must not be considered as absolute dating, although it is certain that

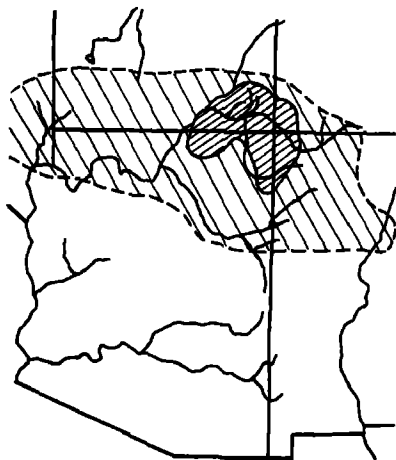


FIG. 79. Map roughly indicating the area of greatest concentration and the extent of Basket Maker II culture. The area of greatest concentration is confined to the San Juan area and is found particularly in the washes draining into the San Juan from the north. The area of maximum spread is probably much greater than that indicated, and even this area is far from densely populated.

some sites were existing at this time. The duration has been suggested on the basis of known culture changes occurring in about this time interval from Basket Maker III on. This is a system of dating which has already been criticized in the discussion of Hohokam, but in the absence of fuller data, and it being accepted that at least a part of this culture does fall sometime within this period, the suggestion of such dates is felt to be more or less justified at present. Possibly it much antedates A.D. 300, for there is a good deal to suggest that the Basket Makers were a widespread basic group.

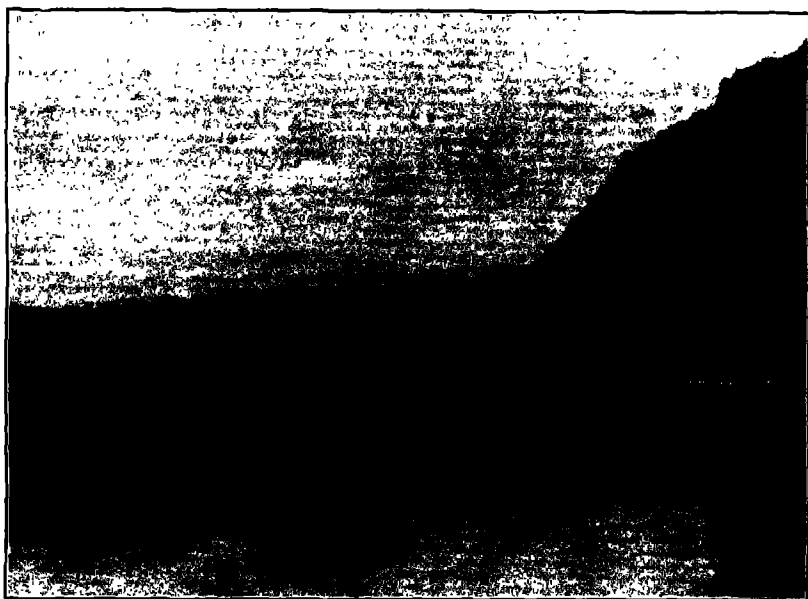
Basket Maker II has been identified in the Pecos classification as the "agricultural, atlatl using, non-pottery-making stage,

as described in many publications." Comparison with the Cummings classification has placed it as the Cave Period.

From the accompanying map it may be seen that this culture is mostly confined to the San Juan drainage, certainly more completely so than any other group. Dr. Cummings has suggested Grand Gulch, Utah, one of the large washes draining south into the San Juan River, as the one locality where the most characteristic Basket Maker II Culture has been found. This might be considered somewhat in the nature of a type site. Other places where it has been uncovered in a more or less pure state by Dr. Cummings and other investigators are Cottonwood Wash, Utah, the Monument valley region of both Arizona and Utah, the Tsegi canyons, the Cariso and Lukachukai Mountains, Canyon de Chelly and Canyon

del Muerto, and the adjoining country of northwestern New Mexico.

The map also indicates that sites, possibly peripheral, have been found as far as southern Nevada, southwestern Utah, the White Mountains of Arizona, and over a relatively large area in northwestern New Mexico. Suggestions of a Basket Makerlike culture have come from even farther afield. Some of the early remains of the Mississippi valley suggest it and appear to have included a similar physical type. Such finds have already been mentioned in New Mexico, and to these might be added a few sites in Chihuahua, Mexico, and western Texas.



Comb Ridge north of the San Juan River in Utah is a type locality of Basket Maker Culture. Sites are found in the natural caves under overhanging ledges along the bluff.

As pottery is entirely absent it is possible to turn immediately to a discussion of house remains. No true houses of this period have been found, although there certainly must have been some sort of temporary shelter. It is a striking fact that most of the known remains are in the caves of the San Juan, and this has led to the belief that the people were primarily shallow cave dwellers. Dr. Cummings in his class lectures at the University of Arizona has described two types of shelters that he found here. The inhabitants seem to have scooped out a shallow de-

pression in the back of the cave and lined it with leaves, shredded cedar bark, or similar material. A windbreak of piled-up rocks or poles leaned against the back wall and perhaps covered with skins or blankets completed these "nests." Such a shelter can hardly be called a home, even though over the greater part of the San Juan drainage remains of this sort are the only ones found which might be ascribed to these people. It

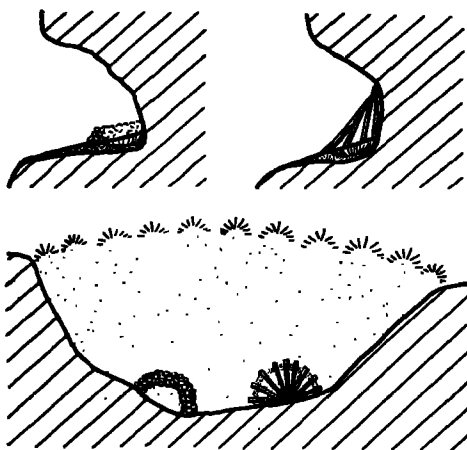


FIG. 80. True Basket Maker II houses are unknown, but these people appear to have used nests in the back of the caves behind a windbreak of rocks or poles, somewhat like those indicated above. It is always possible, of course, that such structures really are the work of later people.

is always conceivable that they may have been the work of later inhabitants. Guernsey has described their homes in northeastern Arizona as being merely "windbreaks."

Although they do not appear to have had a true house they certainly did construct some very excellent caches or storage pits. This arrangement is not a little suggestive of the very fine barns and silos found with insignificant homes in our own rural districts. Cists are essentially circular in form and were dug into the ground either in the loose fill of the caves

or in the bottoms of canyons in the open. Those which are in loose material are almost invariably lined with rocks to hold back the sloping sides. Some are also paved with a flagging of flat rocks, although others are simply clay lined. The average is from three to five or six feet in diameter and is excavated to a depth of eighteen inches to two feet.

These cists were primarily used for storage bins, for from them quantities of cached materials have been removed. The method of roofing varied from covering with one large flat slab of stone to poles laid across the top, covered by brush, and last sand. The fact that most of these pits have been carefully covered and that many of them now contain stored materials would suggest that, for at least part of the time, the owners were away from the caves in which they are found. The economy of the Basket Makers, like that of the Mogollon, was about equally divided

between hunting and agriculture. As a result it is likely that treasured articles, grain, and seed foods were cached here while the owners were away hunting, and at least occasionally never returned for. A secondary use to which cists were often put was the reception of burials, for many fine mummies have been secured from them.

Surprisingly enough the physical type of pure Basket Makers is not well known. Hooton lists a series of San Juan Basket Makers in his report, "The Skeletal Remains of Pecos," but he does not state whether they are Basket Maker II or III and does not give the number of the series measured. Although many skulls and mummies have been found no serious study seems to have been made of these people. Of two things we may be fairly certain. None of the skulls show any flattening of the posterior portion, possibly as a result of the use of a soft covered cradle in infancy, and many of the skulls are long in relation to their width.

The length of the skull is measured from a point directly above the

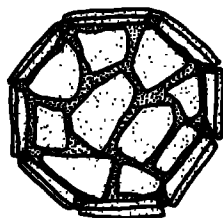


FIG. 81. Cists, such as the one pictured above, are typical of this culture. Some are slab lined, others plastered clay walls and floor, but all are more or less circular.

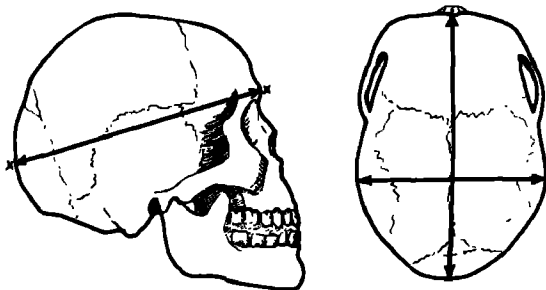


FIG. 82. The true Basket Maker skull appears to be long headed, though not markedly so, as in the illustration. The cephalic index is expressed as a fraction resulting from the width divided by the length. The heavy lines indicate the position and direction of these measurements.

top of the nose in the depression between the eyebrow ridges along the central line to the farthest point back. This is indicated in the accom-

panying sketch by the heavy line with arrows at each end. The width is measured at right angles to this line and across the widest portion of the skull. It is indicated in the top view by the second heavy line. For convenience in comparison, skull shapes are expressed by what is known as the cephalic index. This is arrived at by dividing the width by the length, resulting in a fraction. Three broad classes of general skull form variations may thus be established. These are long headed or dolicocephalic, broad headed or brachycephalic, and medium headed or mesocephalic. They are determined by the following range of fractions.

Brachycephalic	0.80 or more
Mesocephalic	0.75 to 0.80
Dolicocephalic	less than 0.75

Although it at present appears that most Basket Maker skulls are long headed, or dolicocephalic, they are not markedly so, for many of them are near 0.75. In many the top of the skull also seems to show a slight

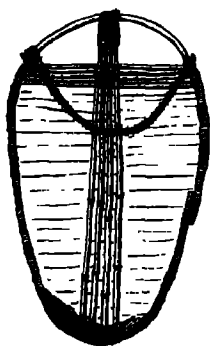


FIG. 83. Cradles are more or less flexible and made of light materials such as the one above of reeds. They were covered with shredded juniper bark or tanned mountain sheep skins to form a pad so that the back of the skull was never deformed.

peak or ridged effect, and although the eyebrow ridges and other processes are more marked than in later Pueblo types the bones themselves are not heavy. As to the exact nature of the rest of the body bones there seems to be some disagreement in the writings of the authorities who have mentioned them, some suggesting they are heavier than the Pueblo people. Adult males seem to have been of fairly good size, one mummy which the writer has seen being nearly six feet long.

Burials are always flexed, sometimes tightly so, and are occasionally wrapped in a robe. Over the head of the body a large flat basket is almost invariably found, and with many a new pair of sandals was included. As has been suggested many burials are in stone-lined cists, and it is possible that the small size of the cist led to the custom of flexing, in which the knees are drawn up to the chest and the arms are usually extended at the side.

Cradles are of considerable interest, for they are definitely of a type different from those used by the Pueblo people. A typical cradle consisted of a more or less oval frame upon which were lashed cross reeds to make it firm but still somewhat flexible. Over this was placed a padding of

shredded juniper bark, mountain sheep skin, or some similar soft material. In the example pictured, a human hair rope tie is shown. Others have been found in which the backing seems to have been made of cord netting. It is assumed that the soft cradle permitted a normal development of the back of the skull, whereas the Pueblo baby board, which was at least in some examples firm, did not, and so deformed the posterior of the head of these later people.

Metates and manos seem to have been relatively rare, although corn was grown. The prevailing type has the flattened surface ground to an oval depression. It is assumed that this was a result of a circular or oval motion in grinding, as compared to the linear movement of later types. Manos are either rounded or oval. Corn was certainly ground on these implements as well as acorns and perhaps some of the more compact berries and seeds which were collected.

Axes are either absent or quite rare, but those which have been found and might be assigned to this culture are always of the full-grooved type. The few known possible examples are very suggestive of those already described from the Mogollon Culture.

Probably the most interesting stone objects are the points, which are relatively large but many of which are beautifully flaked and shaped. They were made mostly by percussion, although some secondary pressure flaking was used. Because of their size and more or less uniform shape, it is assumed that they were atlatl dart points and not arrow points. Many have diagonal side notches for securing them to the atlatl dart foreshaft; some apparently did not. Larger blades are assumed to have been knives. Atlatl points seem to vary from about one and a quarter to one and a half inches long, while knives sometimes reached twice that length. They are made of chert, chalcedony, and other fine-grained rocks.

Basketry is outstanding. In any group in which there is no pottery some such industry as basketry usually is of magnified importance. These people seem to have expended most of their artistic effort on basketry and fiber fabrics such as bags and sandals. With the development of

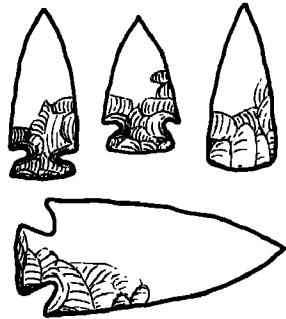


FIG. 84. Both points and knives are illustrated above. The points are atlatl dart points and are larger and heavier than most Southwestern arrow points. Knives like the above appear to have been rare.

pottery by later groups there is a shift of emphasis to that medium. Baskets were made by two weaves. By far the most elaborate forms were produced by the coiled technique. This is the building up of the container from the center of the base by a growing spiral coil which is con-

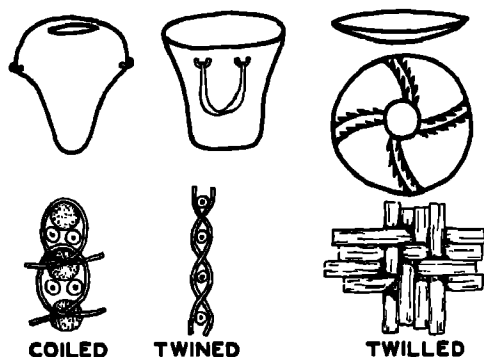


FIG. 85. Baskets are made by two techniques only. Coil types are of two rods and bundle, with the sewing splints passing through the underlying bundle. Certain baskets were also made by the twine technique. No twilled baskets are known from this period or culture. The upper left figure is a pitch-covered, coiled water basket. The loop ties are of human hair cord. The right figure is the typical large shallow basket with design. The central upper figure, a carrying basket with tump strap, may possibly not have been typically Basket Maker, for the specimen pictured is a Pueblo I example. The twilled weave was probably introduced sometime near A.D. 700.

tinually sewed to the one just below. Two rods were included in the coil to give the vessel stiffness, and a bundle of grass or other fibrous material which gave the coil bulk and form a mass through which the splint could be sewed. The second technique was twining, in which radiating rods formed the basis and about which other splints or rods were intertwined. This formed a coarser container and was used for the larger and cruder baskets.

Basket forms are very distinctive, the most common being the large shallow traylike basket. These are from three to four

inches deep and from twelve to twenty-four inches in diameter. Bowl-shaped baskets, with a tendency to flattened bottoms, are more rare. Decoration is effected by dyeing the sewing splints either black or red before they are included in the basket, thus giving three colors, black, white, and red. Water-carrying baskets were made with an almost pointed bottom and were covered with pitch. These are somewhat suggestive of Paiute forms. The carrying basket included in the illustration was either very rare or did not occur this early. The twilled weave was apparently not in use before Pueblo Culture became well established.

Sandals are probably one of the most distinctive traits of these people. At this time all the sandals made were square across the toes. Some had a fringe of buckskin or shredded juniper bark at the toe. Even now there

appear to have been two general classes of sandals, one which had very fine weave and was made of cords, the other of a coarser weave made of partly shredded or whole leaves. The yucca plant furnished the material from which they were made, as it has a very tough leaf with long fibers extending from the tip of the leaf down into the roots. To secure these fibers the plants were collected by being cut off at the root, then allowed

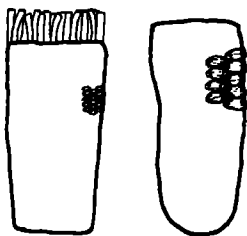


FIG. 86. Basket Maker II sandals all have a more or less square toe. Some have a buckskin or fiber fringe; others do not. Both fine twined weave and coarser weaves appear to have been typical, the coarse probably for general wear.

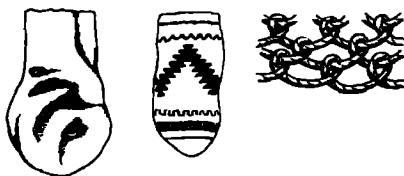


FIG. 87. Bags made of fiber cord are typical of this culture. They are made by a twisted twine weave which starts at the bottom of the center of the bag. Some are plain but others have a colored woven-in design. The detail of weave to the right is what is known as "coil without foundation," and is a technique by which other articles were made, and at later dates.

partly to decompose while moist, and finally were beaten, probably between two pieces of wood, to crush off the softer tissues and leave the long tough fibers. From this material, and apocynum,* cords often of two strands and sometimes in two colors were twisted. The cords were then woven into various objects, one of which was the better class of sandal. Ties are of two distinct types. The most common seems to have been one in which a loop for the toes and another for the heel formed the base, with variations over the arch of the foot. Another type had a series of cord loops around the edge of the sole across which various ties were attached over the foot. No other decoration was found on these sandals.

Another feature of Basket Maker Culture seems to have been the manufacture of cloth bags. These were woven in twined weave, and many have a colored woven-in design. Bags are all inclined to be somewhat larger at the bottom than the top. This technique of producing a

* A plant related to milkweed.

clothlike fabric definitely antedated the vertical, or true loom, in this section.

Shredded cedar bark bags were also produced. The bark was shredded and grouped into long bundles or rolls which were either woven together or tied together by cords to produce a sort of rectangular, blanket-shaped, heavy pad. The ends were then turned back to meet in the middle and were fastened along the side. This produced an envelope open down the middle of the top, to some extent suggesting the hide storage bag or "trunk" of historic plains Indians. These bags were used

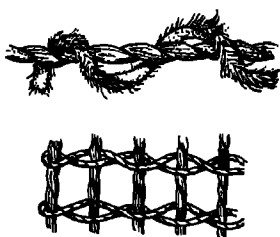


FIG. 88. Robes were made by twisting split feathers or strips of fur around a cord and then tying this together with twined stringers. The upper figure shows the method of twisting a fur strip, the lower a detail of how the strips are held together. This results in a soft and very warm blanket.

for the storage of such large objects as corn on the cob and were often placed in cists. Mats of shredded cedar bark, whole yucca leaves, or even reeds were made in the simpler over-and-under weave and used as floor or house coverings.

The only fabrics at this time which approached cloth in weave, appearance, and form were feather and fur robes. These were made by splitting soft feathers down the vane, or cutting rabbit or other fur into strips, and winding them about fiber cords. The method by which this was done is shown in the accompanying illustration. One strip was lapped under and over the other to continue the winding. These fur- or feather-incased cords were then placed parallel to each other and in contact and tied together by twined cross cords. This produced a heavy but very warm blanket or robe which appeared as a solid mass but was quite open. The Hopi and Paiute Indians still make similar fur blankets.

Such blankets were apparently necessary because of the comparatively small amount of clothing worn by these people. Besides sandals and blankets the only piece of clothing worn by the men was a G string. This was made of yucca fibers looped over and attached to a cord. The cord went around the waist and the fiber mass was drawn down between the legs and up the back to be looped over the cord. Women supplemented sandals and blankets with a short skirt of fibers which was suspended from the cord around the waist. One very complex leather moccasin is also of Basket Maker age, although it was foreign to this culture.

Not only were woven bags made, but skin bags formed from the whole skins of small animals were used. These were made by skinning the animal forward from the back legs to the nose, and tying or otherwise closing the mouth, eye, and foreleg openings. Apparently, small objects were kept in these bags, particularly collections of odd-shaped stones and other ceremonial articles.

Of the few weapons known and used by these people, the atlatl and atlatl dart seem to have been the principal hunting and defensive tool. The accompanying diagram illustrates both these objects. The atlatl dart is a light spear five to six feet long, and about half an inch in diameter, and made of two parts. The foreshaft is a cigar-shaped, short section of hardwood which had the attached stone point at one end and was somewhat pointed at the other. The shaft was of a lighter wood with a small hollow or pith center, and conical holes drilled at both ends. The foreshaft fitted into the front end and apparently was made detachable. The butt was for the reception of the prong on the atlatl. Feathers seem to have been generally used but were not carefully applied, for although three were most common two or four were sometimes used, but apparently at other times none.

The atlatl was a flat, slender, flexible, piece of hardwood, the purpose of which was simply to act as a lever to extend the arm during the cast.



FIG. 89. Skin bags, as the above, are typical. They are skins of small animals tied at the mouth.

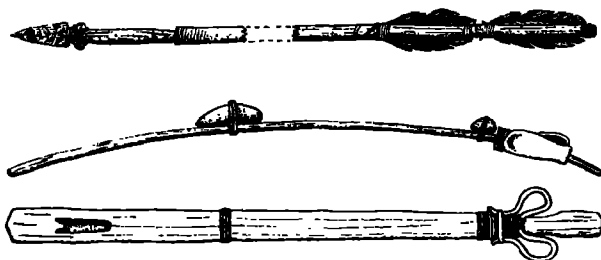


FIG. 90. The top illustration shows an atlatl dart with the mid portion removed. It consists of a feathered shaft and a short hardwood foreshaft with the point. This is really a light feathered spear. The atlatl shown in side and top view is a flexible throwing board which acts on the principle of the lever to lengthen the arm. This specimen has two weights, or charms, attached to its under surface. It is certainly an ineffectual weapon as compared to the bow and arrow of later periods in the plateau.

The upper surface was flat, the lower slightly convex. The handle was shaped at one end, which ended with two loops, usually of leather, through which the fingers were inserted. At the other end, on the upper surface was a groove which terminated with a small point flush with the surface. This was to engage the butt of the dart. On the under side small



Narrow-leaf yucca plant from the fibers of which many articles were manufactured.

stones called atlatl weights were sometimes lashed. These are assumed to have been charms, for they could have served no useful purpose. The atlatl illustrated has two such stones.

In throwing the dart the atlatl was gripped in the hand with the flat side upwards over the shoulder. The first and second fingers were hooked through the loops and used to steady the board. The butt of the dart was placed in the groove against the point, and the shaft steadied with the thumb and third finger. The cast was made overhand by releasing the dart during the forward throw. Such hunting devices have had a widespread distribution throughout the world but as compared to even a moderately effective bow and arrow are rather poor implements. The aim is not so accurate as with the bow, nor is range so great, although the shocking power with the heavier atlatl dart was probably more.

Grooved clubs are also a characteristic feature of this culture. They are made of wood and are about three feet long. Four longitudinal grooves incised into each side extend from the handle to the top. These lines are always broken at one place in their length. It has generally been accepted that they were used as rabbit sticks, in a manner to be described later, but in a recent conversation with the writer Mr. Amsden suggested that they might also have been used as fending sticks in conjunction with the atlatl. They are similar to such sticks used for this purpose elsewhere.

Food is represented by a great variety of animals, some of which were relatively large. Deer and mountain sheep were commonly killed, and all the small rodents were trapped. Some very ingenious nets and snares were devised for this purpose, one being of the purse

type. Large nets suggesting tennis nets, made of cords, were probably used to catch rabbits which were driven into them. Human hairs were also made into snares for birds. Vegetable food was also varied, apparently consisting of every edible seed and nut, as well as berries. Agriculture consisted only of corn, squash, and possibly the sunflower. Corn was of the yellow flint variety, and the ears, by later standards, were very small, almost what a midwestern farmer would call "nubbins." No stone hoes were known in this area; the wooden agricultural implements developed at this time seem to have carried through all subsequent periods and cultures in the plateau. Pointed sticks, some with a crooked handle, were used in planting and perhaps in breaking the soil. Sticks with flattened blades, as in the illustration, were also used to loosen the soil, and possibly for weeding. However, agriculture was not a basic industry to these people, their efforts apparently being about equally divided between hunting and farming. The only domesticated animals are the dog and perhaps the turkey, which was certainly domesticated in the following period.

Ornaments, though not greatly varied, are distinctive. Stone beads of both globular and elongated forms are typical. They are made of hard

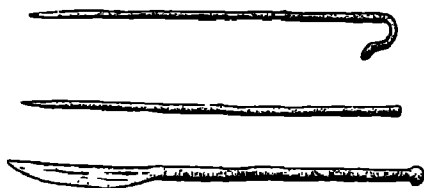


FIG. 91. Basket Maker and Pueblo agricultural implements are digging and cultivating sticks as in the illustration. Some have straight points and crooked or straight handles; others have blades. The former were probably for planting, the latter for loosening the soil.

stone, some of granite, and are highly polished and drilled. Acorn cups and a variety of small hard seeds were also drilled and strung. However,

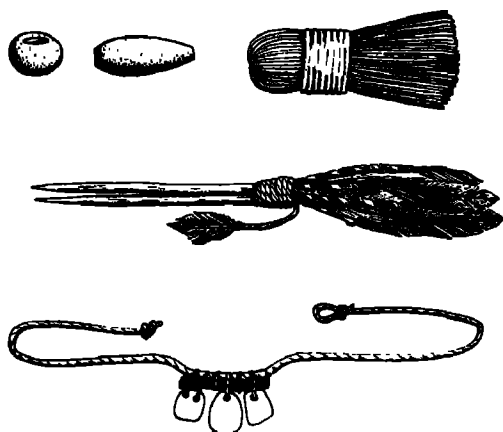


FIG. 92. Basket Maker people made great use of feathers as ornaments. The central figure is probably a feather hairpin. The two upper left illustrations are stone beads, the right a grass stem hair brush. The lower necklace is of the short choker type with the loop and toggle tie, and is very characteristic of these people.

by a loop and toggle. Most of these had ornaments, such as pendants, tied to only a short section of the front portion. Hair brushes made of grass stems bundled and tied together, although not ornaments, might be mentioned at this time. Such objects are still in use by the Hopi Indians.

Cylindrical pipes of both stone and clay are very characteristic. They are long and slender, or short and squat, as in the illustration. Stone pipes were often made of slate, banded or plain, and were drilled from both ends. Occasionally a bone tube was added to short forms, but the long slender straight pipe seems to have been most typical. Many of these objects were finely made and polished, and apparently they were prized possessions of the Basket Maker people, for they were often buried with the dead. To the knowledge of the writer there is no absolute information as to what was smoked in these pipes.

the most distinctive ornaments seem to have been feathers. These were sometimes attached to strings, which were apparently tied to the hair, or were fastened to sticks bound together to suggest combs. Some combs in the succeeding period were made by tying several pointed sticks together like a high Spanish-type comb and were ornamented with beads or other objects. The short choker-type cord necklace is also typical. It was only long enough to go around the neck, and was fastened in the back



FIG. 93. Straight stone and clay pipes are very common to this group. Some are longer and more slender than others, and a few have bone stems as already described and pictured.

Bone implements seem to have been much less abundant than at other times or in other cultures. The awl appears to have been most commonly of the short type pictured, or made of a splinter of bone sharpened at one end and perhaps spatula shaped at the other. Split deer metatarsals, with the head left, were either rare or lacking. Bone tubes, used as beads, and bone tube whistles, often of bird bones, were

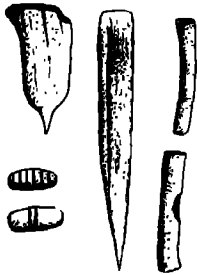


FIG. 94. Bone awls do not appear to have been made of split deer metatarsals. Bone dice with incised lines and bone tubes and whistles are all typical.



FIG. 95. The wooden doll figured is reported by Guernsey. It may represent a pre-pottery figurine effort of these people.

made at this time. The whistle carries over to modern Hopi Indians in much the same form. Bone dice were also a distinctive trait. These are small oval or rounded-end fragments of polished bones, which have varying numbers of incised lines crossing their faces. It has been suggested that they are gaming implements because of their similarity to bone dice used by the Pueblo Indians in gambling games today.

Guernsey reports the finding of a small wooden doll, as shown in the illustration. As no pottery was known to these people they could not make fired-clay human figurines, and this may perhaps represent the same idea as expressed in wood. Probably it was made as a plaything for a child.

In summary an unusual list of characters are found to be typical. The area occupied is primarily the San Juan drainage, most of the sites being located in the deep box canyons so characteristic of this section. True homes are lacking, but shelters or windbreaks have been found in caves which may have belonged to this culture. Stone-lined circular cists are typical, burials often being made in them, or they were otherwise used as storage caches. The physical type is at least in part long

headed, approaching medium headed, and is never deformed posteriorly. A flexible oval cradle was used, which was covered with shredded bark or other padding. The metate has an oval grinding face, never a lineal one. Axes are very rare, or absent. Points are atlatl dart points, longer, broader, and heavier than later arrow points. Stone knives, larger than these points, are rare. The most typical basket is the large flat traylike basket which usually accompanied burials and was placed over the head. Other, deeper and more bowl-shaped baskets are rarer. Sandals are one of the best diagnostic traits of this period; they are always square toed, sometimes fringed. Bags were made in the twined weave. Robes, probably of both feather and fur, were made by tying together wrapped cords into the form of a blanket. Skin bags were also made of the whole skins of small animals. The atlatl and atlatl dart is characteristic, as is the grooved club. Food consisted of wild plants and animals and a small variety of yellow flint corn. Ornaments may be characterized by the profuse use of feathers. These occur attached to combs or to cords. Large round and drop-shaped stone beads are very characteristic, in fact one of the diagnostics of these people. Tubular stone and clay pipes are almost equally characteristic, as are bone dice. Seed beads of various sorts are also important.

Of this long and impressive list certain features may be considered distinctive of the Basket Maker II stage of culture. Probably the most distinctive are the square-toed sandals and the stone beads. To these may be added the undeformed skull, flexed burials in cists, and the use of the atlatl and atlatl dart. Not only does positive evidence help to identify this group but the definite lack of certain other features is equally important. Pottery is never present, even in sun-dried form, and houses, as such, were unknown. The bow and arrow is absent, as are beans and cotton.

From this it is apparent that Basket Maker II Culture is distinct from anything previously discussed, and in the following chapters it will be found to be distinct from later cultures. There is much to suggest both Mogollon Culture and certain semi-nomadic groups now found living in the Southwest, but as Basket Maker III Culture is nearer to them the problem of their apparent relationship will be discussed in the next chapter.

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A much more complete bibliography, some of which deals with this subject, will be found at the end of this book.

Chapter XVI

SETTLEMENT PERIOD A.D. 500-700

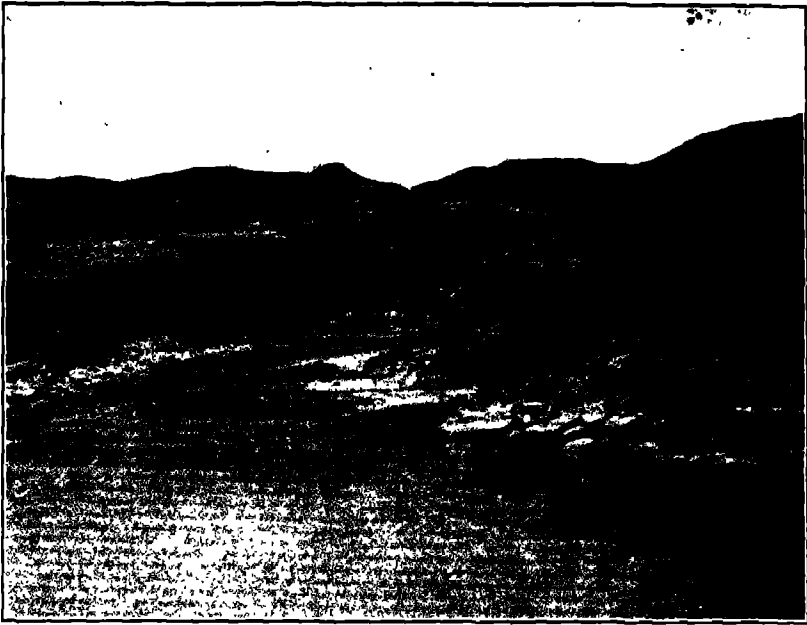
BASKET MAKER III CULTURE

In the preceding chapter basic Basket Maker Culture has been identified as the earliest known stage represented in the plateau. Basket Maker III in many ways appears to have been an evolution of this culture, attaining a slightly higher level in most traits and with the introduction of a few new and distinctive characters. Almost certainly most of these traits came from people with whom the Basket Makers were in contact. As a result, before the end of this period, radical changes were under way, which became much more intensified during following times.

This period and culture may be dated with much more accuracy than the preceding, for a great many more tree-ring dates have been secured. (See Appendix I.) The earliest definite dates from a Basket Maker III house have been secured and reported by Morris. The earliest of these are near the end of the fifth century; specifically, the earliest is A.D. 475. Although the beginning date of 500 remains somewhat vague, the end date of about A.D. 700 is much better established. Certainly in many areas, by this time, a Pueblo I type of culture had evolved. There is some evidence that this period could with profit be split in half, the earlier portion being confined to those people who did not have pottery, and the latter half to those who did.

The Pecos classification has defined this culture as the "pit or slab-house building, pottery-making stage," and to this is added the following: "pottery decoration characterized in general by coarse lines, unattached dots, simple designs, many basket designs, some conventionalized life designs, with generally a coarse paste and characteristically globular shapes."

The area which it occupies is to be seen on the accompanying map, where it becomes immediately apparent that an eastward extension has taken place. Although this extension may be more apparent than real, it



A general view of the San Juan River north of Kayenta. It is along this stream and its tributaries that the most typical Basket Maker and Pueblo Culture is found.

is quite likely that the development of substantial houses made life possible in areas away from the protection of the deep canyons and resulted in geographical expansion. The southern extension which includes the Little Colorado Valley did not have a very dense population except along the several large washes draining southwestward out of the Hopi country. The area of maximum occupation is marked by very few sites, and these are probably not quite typical Basket Maker. In no section, however, was a very dense population found, for the nature of the economy prevented large settlements.

The earliest houses appear to have been a natural evolution of the cists of the preceding period, for many of them are actually little more than elaborated large cists with roofs. They are circular, or roughly so, some egg shaped in plan, and range from three to five feet deep and from nine to twenty-five feet in diameter. In soil which would permit, the walls are clay plastered, while in looser soil they were slab lined, occasionally the floor being slab covered as well. Houses of this type have been found both in caves and in the open, and in these forms range

from Navaho Canyon through the San Juan to Chaco Canyon on the east. Firepits are usually near the center, and occasionally small slab-

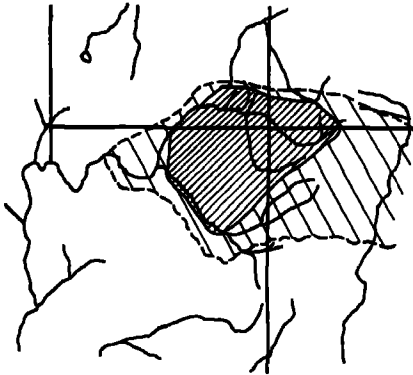


FIG. 96. Area of greatest spread and concentration of Basket Maker III people. The purest and most abundant sites still are found in the San Juan drainage, but a few people of this group had spread down about to the Little Colorado River. There also appears to have been a general shift to the east. It must be remembered that a culture suggestive of this is found very widely in both the Southwest and much of North America.

lined storage bins are on one side.

The main distinctions which may be drawn in this type of house lie in the methods of roofing. Dr. Cummings has described in his classes an arrangement of small poles set about the periphery of the house which were drawn together and tied in the center of the roof. An opening was left on one side, and the poles were covered with mats or brush and finally plastered over. A second much more characteristic type apparently was the four-post arrangement, in which the posts were set into the floor in the form of a square. These supported the roof beams, against which side poles were leaned

from the edge of the excavation. These poles were then covered with brush or matting, and the whole plastered over. The result was a house rectangular and flat at the top, but with a circular ground plan. A third type of roof was formed by placing the four support beams on a small shelf or banquette and pointing them in to meet in the center. This would have resulted in a quadrilateral pyramid effect.

To the east, at Shabik'eshchee Village in Chaco Canyon, Roberts found circular and almost rectangular pithouses with quadrilateral post arrangements, but with two extraordinary features. On the floor of several of these rooms were low ridges of clay which led from the firepit, near the center, to the walls diagonally through the front corner posts. Morris reports essentially the same arrangement from his work in the four corners area. Roberts also found several definite entrances, some slab lined, a few of which expanded into a small antechamber or an alcovelike second room. At Kiatuthlanna circular pithouses had somewhat similar features, but there the entrances were replaced by ventila-

tors. At Grand Falls, on the Little Colorado River, the writer found late houses with the floor ridge and entrance.

Thus the house type at this time seems to have been very varied regionally. In the western San Juan proper, houses are circular and rarely have the peculiar features that are found to the east or southeast, although the floor ridge was found in the Kayenta area. Even though these sites apparently fall late in the period they are much more

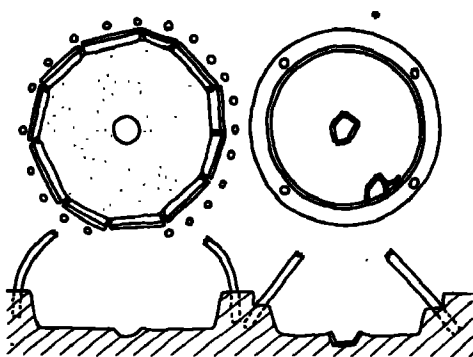


FIG. 97. More or less circular pithouses are typical of Basket Maker III Culture. Some are slab lined; others only clay lined. Two types of roofing are found: those in which poles are set on the rim and bent over to meet in the middle; and four posts, either set vertically in the floor or slanting in from a bench on the sides. Some of these houses are egg shaped or oval.



One of the late Basket Maker circular slab-lined pithouses found by the Museum of Northern Arizona near Grand Falls on the Little Colorado River. This structure shows a floor ridge radiating from the firepit.

elaborate than those of the west and lend weight to the feeling held by the writer that the new influence came from that direction.

Another site, not as yet reported on but of the utmost importance, should be mentioned. This site, Alkali Ridge, in southeastern Utah, is probably a more or less intermediate culture between Basket Maker

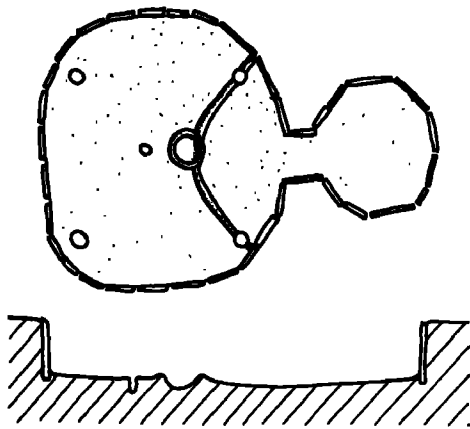


FIG. 98. The type of pithouse found late in the period in the eastern San Juan and Little Colorado drainage areas. The house is circular but tends to rectangular, has a raised clay ridge leading from the firepit to the sides, and in many cases an "annex" entrance.

III and Pueblo I. It was dug by J. O. Brew for the Peabody Museum. Houses are like those of Chaco Canyon, having floor ridges and ventilators or alcoves. In form they are both round and almost rectangular. Of even more interest is the presence of a red-on-orange or brown pottery, which to the writer strongly suggests Mogollon ceramic influence. The same type of site has subsequently been reported by Morris. Houses are the same, with antechamber and floor ridges, and the storage rooms in a block behind these houses are identical.

Latest types show the use of some of these storage rooms as living rooms. The cultural instability and unrest, which was even then evident, probably resulted in the marked changes between Basket Maker and Pueblo Culture.

At, or slightly before, the beginning of this period sun-dried clay vessels were being produced by the Basket Maker people. Although a true and rather fine pottery was made by both the Hohokam and Mogollon people at an even earlier date in southern Arizona, every step in the natural evolution of pottery making is known from this section and culture. The earliest vessels were produced by lining a basket with clay and carrying it up above the rim. Sometimes large clay luglike handles were modeled on the rim portion. Crushed juniper bark was included in the clay to prevent it from cracking during drying, and the natural shrinkage of the clay permitted its being removed from the basket. (See

the upper two right figures in the accompanying diagram.) It was assumed that the idea of including vegetal matter in the clay was derived from the use of such material in the clay linings and "bricks" used in house construction. Soon grass stems were substituted for shredded bark, and at about this time it appears that firing was discovered as a method of making the pottery more substantial. The next step was the substitution of sand grains for grass stems, and a much better and thinner pottery resulted.

Whether or not this represented an independent discovery in the San Juan has long been a matter of discussion. Morris working in the eastern San Juan first pointed out this sequence and suggested that it represented the discovery of pottery making in this section. At the same time, 1927, the Arizona State Museum Expedition in the four corners also noted this sequence. Morris has since found, and displayed at the science meetings in Flagstaff, a basket-impressed sun-dried vessel and a larger fired brown vessel of what is obviously a Mogollon type. Both

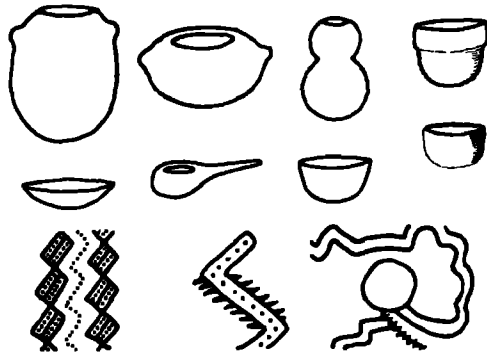


FIG. 99. This figure illustrates Basket Maker pottery forms and designs. Forms tend to be globular. The upper right figure is a sun-dried clay vessel molded in a basket shown just below. Design elements are unattached dots and coarse lines.

came from a Basket Maker burial. In his most recent report he has further mentioned and described this association of Basket Maker types with what is obviously Mogollon pottery, most probably San Francisco Red, or derived types. This indicates that at least in the eastern part of the area these two people had come in casual contact before the making of definite pottery in the north. From this contact the idea of pottery making probably preceded exact knowledge of the technique, so that experimentation, aided from time to time by additional specific information, gave rise to the sequence already described.

Two types of pottery were produced by the Basket Makers, Lino Gray and Lino Black-on-gray. Lino Gray, very likely the first type, is of a hard coarse gray paste with sand temper. Fracture is irregular, and the

sand grains protrude beyond the surface, in many pieces showing fine lines radiating from the grains. The forms are all globular, strongly suggesting baskets and gourds or other life forms. It is interesting to note that this type and its companion are the only pottery types in the Southwest with true spouts, for some gourd-shaped ladles have hollow, pointed handles which are open at the tip. Lug handles, placed above the center of the vessel and perforated vertically as though for the insertion of a handle, are common. Forms are rounded jars, some with a second globular neck, flatter jars suggesting seed jars of later periods, double-lobed small jars, and both deep and shallow bowls. (See accompanying illustration.)

Lino Black-on-gray seems to have been a slightly later development which was decorated with a black design. Forms and the scraped rough surface finish are the same, although painted surfaces were more carefully finished. Designs are both geometric and life forms, the former apparently in many cases having been taken directly from basket or other fabric decorations. The most common elements are coarse lines, approximating an eighth of an inch in width, and unattached dots. Short crossed lines, slightly suggesting pendant triangles, and points occur. Life designs, all crudely executed, vary from human to unidentifiable forms.

Several other types of allied gray and black-on-gray pottery have been identified from other sections. One division into east and west may now be made on the basis of pigments. Those of the west are a carbon paint which does not turn red in an oxidizing atmosphere. The eastern types have an iron paint which does turn red. Certainly an even more careful examination of all these types would be profitable.

Associated with this pottery is a very small amount of finely made black-on-red. Although this is a widespread type its point of origin is not definitely known. Because it is entirely foreign to the rather well-controlled reducing atmosphere of the Basket Maker types, it is assumed to have been introduced in small amounts from some other area, possibly the Mogollon.

Two other interesting objects of clay were made at this time. One is small human figurines, always female, which tend to suggest at least indirect contact with the Hohokam. They are decorated with punched and incised designs, as in the accompanying illustration. The other object is also made of clay but is conical and has a hollow base. As the use to which it could have been put remains problematical, it often has been called ceremonial. The ceremonial class has been a most useful

category to the archaeologist, for those objects the use of which he cannot definitely identify are often pigeonholed here.

The physical type of these people, like that of the preceding group, has never been carefully determined. One fact alone remains clear: none of the crania show definite posterior deformation, and the cradles are of the same soft type. The head form seems to vary from long to medium, particularly in the eastern San Juan, where Morris reports the finding of undeformed broad-headed individuals of this culture stage. Burials are generally the same, although at one place, again in the eastern San Juan, crypts were undercut in the solid stone bottom of the caves for the reception of bodies. Actually this is not a far cry from the usual cist burial.

Metates and manos changed from those with an oval depression to the lineal type. These are essentially of trough shape, and in the east are open at only one end. Block-type manos are by far the most common form. It is possible that some of the oval metates may have survived in the western San Juan. The few known axes which may possibly be ascribed to this culture are both of the full-grooved and the three-quarter-grooved type. The former are apparently the original form; it was supplemented later by the three-quarter-grooved axe, which probably reached the Basket Maker people from the Hohokam through the Mogollon. Mauls, both full grooved and three-quarter grooved, also occur. The most common type to the west is the full-grooved rounded form, while to the east the three-quarter-grooved type is more common. For examples of these types already pictured see Figs. 73 and 74.

Chipped points and blades are essentially as described and pictured for the preceding period, for the atlatl and dart still survived. However, almost at the end of this time, or sometime between about A.D. 650 and 700, the bow and arrow was introduced into the eastern section. At an even earlier time Morris reports that the resident Basket Maker people were in contact with bow-and-arrow-using people, for he found one individual in Canyon del Muerto with an arrow still in her body. The

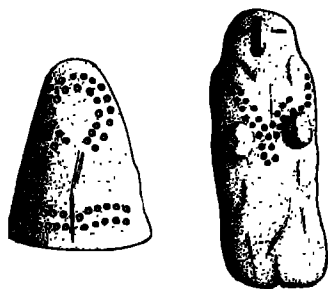


FIG. 100. Both human figurines and conical clay objects are found in Basket Maker III sites. Apparently all figurines are female, and both objects are decorated with punched dots and sometimes incised lines.

arrival of the bow and arrow is definitely proved by the finding of arrow butts, which had grooves instead of the usual drilled hole in the end, thus indicating that they had received a string instead of the prong on an atlatl. What few points have been found that might have been used in arrows are larger and coarser than most later types and suggest atlatl points. In general workmanship they are similar to the Mogollon type.

Basketry is the same as that of the preceding period, both as to form and decoration. There are probably more of the smaller and deeper baskets, but the shallow traylike baskets were also sparingly made. Possibly the first platted types were introduced at this time. These were formed by cutting off the narrow-leafed yucca plant at the base and interweaving the leaves to produce a small narrow baglike container with a returned and tied-down rim. This type seems to have lasted sporadically into later periods, a situation which may occur in any trait, for once an object becomes established it may recur at any subsequent period.

Besides pottery, the most characteristic feature of this culture stage is the manufacture both of very fine sandals and of tump straps. Two classes of sandals were again made, those which were for everyday wear, and much finer dress sandals. The finer ones are of particular interest, for they are the most distinctive. Instead of being square-toed they have a crescent portion left out of the toe, and so are called "crescent toed." This was probably a result of suspension of the warp threads on a loop instead of a bar. The heels are commonly bent up and tied together. In the most elaborate forms the upper surface is divided into three zones. The toe portion carries a band with geometric designs in colors across the ball of the foot. The central section has a longitudinal ribbed pattern, and the heel either no pattern or a second band of colors in designs. The under surface has a geometric raised design, not unlike the tread on an automobile tire, and perhaps for somewhat the same reason. Life in the cliffs meant that good footing was a necessity.

Sandals of this class are woven from very fine cords of yucca or apocynum fibers in an over-and-under weave. They are made double so that the colored design does not extend through to the under surface. The raised design was formed by placing a tuft of fibers under the filler cords as they were woven. These sandals are really amazing examples of weaving, and once seen can never be mistaken for other types.

Tump straps are an American device by which heavy burdens were carried on the back, suspended from the head. Basket Maker tump

straps were woven from cords, like the sandals, and often had similar geometric color designs. Two loops, one at each end, formed a base to which ropes were attached, and which in turn were attached to the burden. The load was raised to the back and the tump strap placed high across the forehead. By leaning forward the burden was supported by the back above the hips, but the strap prevented it from sliding off. In difficult climbing, such as negotiating hand holes pecked into the side of a vertical cliff, the hands were left free. The amount of preparation and effort which went into the making of these objects and sandals is impressive, and the best were undoubtedly highly valued by the makers.

Bags were still made, as were both feather and fur robes. Parts of the robes were often of feathers while other portions of the same article were made of fur. Skin bags were also still used, apparently. As has already been mentioned, the atlatl and atlatl dart were certainly in use until about the end of the period, when the bow and arrow was introduced. Digging sticks remained definitely the same.

Ornaments show little change, particularly as regards the survival of feathers. The large stone beads do not seem to have been made in such abundance, and shell beads were much more common. Olivella shells were particularly popular, being simply broken or ground off at the end for stringing. Turquoise was established in the east by this time, for beads and pendants of this material have been found.

Pipes are very characteristic and show little change, although the form seems to have been more commonly cigar shaped than stockier. Bone shows little change, with the possible exception of awls, many of which are now of the split metatarsal type with half of the head of the bone left intact. These forms are inclined to be longer than earlier types. Bone tubes and whistles were still rather common.

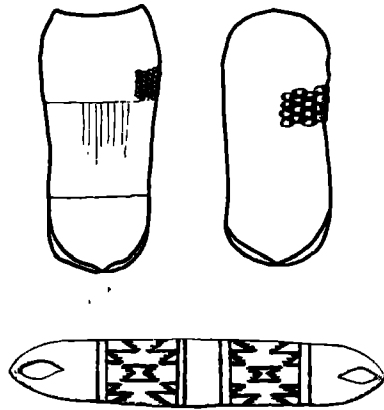


FIG. 101. Crescent-toed sandals appear at this time. They are very finely woven, often with color designs on the top and raised patterns on the bottom. Coarser sandals were also made. The tump strap shown below is twined woven and has a color design in geometric pattern. These are very characteristic Basket Maker III features.

In the earlier portion of this period the food of these people was very similar to that of the preceding group, but toward the end changes may be noted. Turkeys were certainly domesticated at this time, for definite

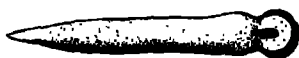


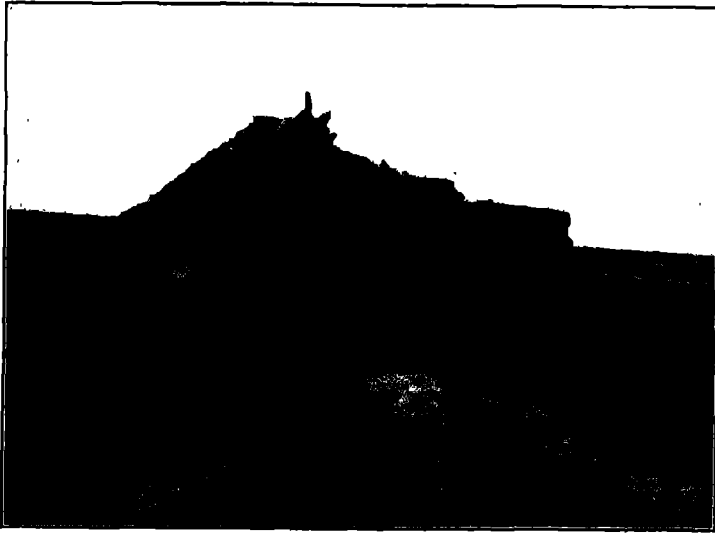
FIG. 102. Awls of the long split metatarsal type appear at this time.

evidence such as enclosures and masses of manure have been found in the caves occupied by Basket Maker III people. Almost at the end of the period the type of corn seems to have changed from the small yellow flint variety to a larger ear, some of which has variegated colors. In the eastern portion of the San Juan beans were also introduced to complete the corn, bean, and squash diet so typical of the American Indian.

By way of summary only a relatively few features are found to be typical of these people when they are compared to Basket Maker II. Essentially circular pithouses came into being generally, and although they show what may be an eastern and western variation they are all of one general pattern. Probably the best diagnostic is pottery, although it was made most abundantly during only the latter half of the period. Unfired clay vessels are an aid in dating the earlier portion. The skull is still undeformed, although apparently undergoing change to a broader type. Elaborate crescent-toed sandals are an excellent criterion of this group, and show involved techniques of weaving in color and raised patterns. Other traits remain about the same as in the preceding period. The difficulty of identifying characteristic traits of each period will increase as more recent time is reached, for, as has been many times suggested, much material carried over and cultural influences from other groups became more marked.

Near the end of this period several changes from pure Basket Maker Culture were already under way. Because many of these seem to have taken place to the south and east of the main Basket Maker Culture area, it is logical to assume that the influence responsible for them came from this direction. In the southern portion of the mountain section Mogollon Culture, which appears to have been quite strong at a very early date, was noted. Many of the characters which have been mentioned bear a Mogollon stamp, a fact which has led some archaeologists to suggest that influence has been from the Basket Maker and Pueblo people to the Mogollon instead of the reverse. The fact that Mogollon probably antedates Basket Maker would imply that the main influence was to the north, although some characters must have been exchanged.

This has led to the suggestion that Mogollon or at least a Mogollon-like culture was responsible for the development of pottery in the plateau. Houses also probably had their main impetus from this source, and certain stone artifacts such as the axe and point types probably came from here. Perhaps even the later physical type was a Mogollon-Basket Maker cross. As has been suggested previously it is quite possible that Mogollon will eventually prove to be slightly different from the culture as now described, but many of the basic characters will certainly remain unchanged.



Modern Navaho Hogan. It is such houses as these which when in ruin and unaccompanied by European articles would somewhat suggest Basket Maker sites.

That Basket Maker Culture, even in this later period, is distinctive cannot be denied, for a long list of traits are found to be characteristic of this general Basket Maker Culture. The economy was not predominantly agricultural, but about equally divided with hunting. The atlatl and dart were used, and a great variety of traps and snares were employed. Turkeys were domesticated. Interest in arts was primarily centered in weaving fabrics of fibers other than cotton, and some surprising results were achieved. Baskets, sandals, bags, and tump straps are all characteristic and well made. Feather and fur robes were pro-

duced, and great use was made of shredded cedar bark, both as bags and mats. Skins were tanned and utilized in a variety of ways. Human hair was widely used as rope as well as tied on baskets, with the result that many of the women kept their hair cut short as shown by the mummies which have been recovered. Thus the first bobbed-hair American flappers are of some antiquity. Much use was made of feathers as ornaments, although other objects like stone and shell were also used. Beautiful highly prized cylindrical stone pipes were made. Bone whistles were used. Circular cists, or caches alone, were first characteristic, and later circular pithouses were widely made. In all it is a very characteristic culture, which had certain definite traditions of work radically different from those of other cultures, and even from the Pueblo Culture which followed and into which Basket Maker Culture seems gradually to have evolved.

Certain people living in this area today show similarities of culture to the Basket Makers, as has been pointed out. The Paiute are apparently very close in many of their traits. The house is somewhat similar, excellent coiled basketry is made, skin blankets are woven, and the economy is similar. Early Navaho Culture, without European influence, suggests Basket Maker. Houses are usually circular and somewhat excavated. Basketry was made by coiling, and a crude, open-mouth pointed-bottom pot is the only ceramic effort. Economy was similar, and only the larger use of hides would be a distinction. As a result the writer has considered the possibility that a few of the supposed Basket Maker sites, particularly on the periphery of the area, might actually be the remains of early Paiute, Navaho, or similar people.

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Chapter XVII

ADJUSTMENT PERIOD A.D. 700-900

PUEBLO I CULTURE

Pueblo I Culture has been characterized in the Pecos classification as: "Crania deformed, true masonry develops in some areas, pottery is characterized by neck coils being developed." To this might be added

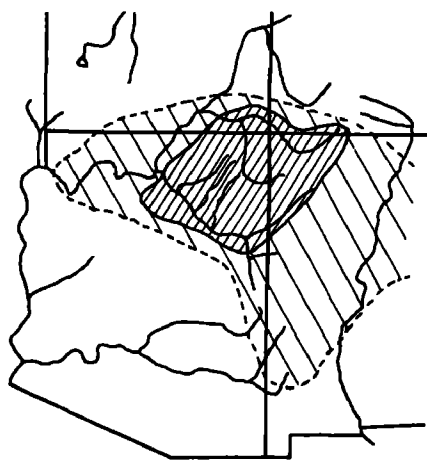
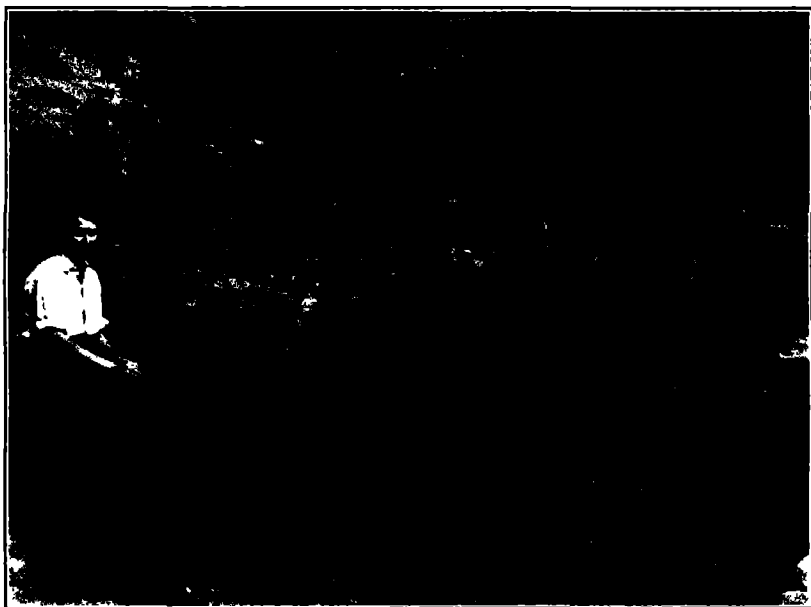


FIG. 103. Pueblo I Culture shows a slightly greater northeast-southwest expansion than that of Basket Maker III in the area of purest sites. This section is confined to the San Juan and Little Colorado River drainage areas. Purest sites appear to be those found in the Hopi country along the washes draining south into the Little Colorado River. The area of maximum expansion has been made deliberately larger than it probably should be, particularly to the west and south, but sites with pottery having neck coils are found in these directions.

the introduction of slips, high polishing, designs characterized in general by extremely fine lines, attached dots, and high triangles in the black-on-white types. It is well to keep in mind the fact that in such a definition, largely based on pottery types, none of the pottery designated as diagnostic of a period or culture suddenly appeared in full bloom. Actually, gradual pottery gradations took place from Basket Maker III through Pueblo I to Pueblo II. As a result the pottery types described in detail are simply the most distinctive for each group and time period.

The area occupied by most typical Pueblo I Culture is not greatly changed from that of Basket Maker III. It probably enjoyed a slightly more eastward expansion, as well as south into the White Mountain area, and

southwest to about the San Francisco Mountains. The area of maximum extension has purposely been made ample, although there is at the present time some doubt that it actually spread either as far west or south as shown. Pottery types found in both these areas suggest Pueblo I, though they are not identical with it, and for this reason the large area has been indicated. At least it may thus be suggested that rather wide contacts and perhaps influence existed at this time.



An example of the wattle and daub type of construction used for walls in Betatakin Pueblo. A tied brush fence was first built and then plastered with adobe. This is probably a very early form of wall.

Of the stages in Pueblo Culture, least is known of Pueblo I. Regional variations appear to have been very common as regards both house and pottery types, and almost every site of this culture shows evidence of Basket Maker or Pueblo II occupation as well. This general mixture has made it very difficult to separate true Pueblo I from the other manifestations, and has suggested the possibility that this is actually a relatively short stage which represents a period of change or readjustment and stabilizing of culture from the Basket Maker complex.

At present the time period seems to be fairly well established from a number of sites scattered throughout the plateau area. Any site which is found to date after about A.D. 700 contains neck-coiled pottery, probably the best single Pueblo I diagnostic. The end is very well and accurately dated, at least in the Flagstaff section. Neck corrugations are found to become indented at about A.D. 890, and by 900 definite Pueblo II black-on-white types were established here. As a result the duration of this stage of culture, over most of the plateau may roughly be stated as from A.D. 700 to 900.

According to the survey findings of the Museum of Northern Arizona specific places where Pueblo I Culture is well represented are Navaho Springs district of the Rio Puerco, Komar Springs in the upper Jeddito Valley, along the Polacca Wash, and in the Moenkopi Wash and Hopi country.

Certain pottery types of this period are very characteristic and easily identified. The chief plain or cooking pottery held more tenaciously to the globular shapes already described as characteristic of the preceding period. The utensils are gray, both in paste and surface color, and contain coarse sand temper. Some forms appear not to have had any decoration and so are at present indistinguishable from Lino Gray. Further study of these types will probably make distinctions possible on the basis of shapes, but so far this study has not been comprehensively attempted.

The most common utilitarian type is Kana-a Gray. The body of these vessels is always undecorated, but the neck is made up of flattened coils. It has been suggested that the body was modeled after the manner of Lino Gray, but that the necessity of restricting the neck led to the development of coiling in this portion of the vessel. It is possible to make a distinction in the manner by which the coils were produced. In one type the coils are simple circles of clay which were made and applied in a unit before they were flattened to the coils below. These might be termed "neck coils." The second type was the construction of the neck by a continual spiral of clay, which begins at the base and works gradually upward to the rim. This type might be termed "coiled necks." It is further felt by some that this represents an evolutionary development of the coiling technique in this area, the former type appearing first. The writer, however, remains to be convinced on this matter. Forms are either jars or pitchers with the first true handles.

The second common type of pottery is Kana-a Black-on-white. This

is the first true black-on-white pottery to appear on the plateau and shows the first common use of massed black areas in decoration, the effect being achieved by outlining the geometric patterns and filling them in solidly with black. The paste is gray and contains sand temper. Decorated surfaces are scraped down and characteristically polished with a smooth pebble before firing. Some are apparently covered with a true slip; others have only been polished while damp to produce a



FIG. 104. Pottery designs and forms of the most characteristic types of this period. Forms still tend to be globular. Perforated lugs are present. Neck coils are most typical and a diagnostic of this period and culture.

semblance of a true slip. The outsides of bowls, or other undecorated surfaces, are often only scraped and left somewhat rough. Forms are bowls, usually with more or less steep sides, relatively large jars with a tendency to sloping necks, seed jars, and small pitchers.

Designs are characteristic and formalized for the first time as regards elements. All true Kana-a Black-on-white types have geometric designs made up of very fine lines, high triangles, and attached dots. These may be combined into several patterns, two of which are shown in the accompanying illustration. Of these the right-hand design was possibly slightly earlier, and in fact somewhat suggests elements found on baskets. The surface is white, sometimes almost as white as paper, and de-

signs are in a clear, more or less lustrous, black paint. Execution is on the whole good, though a careless overlapping of the fine lines is very typical.

The introduction of any new medium of art expression characteristically leads a people through a period of groping before techniques become standardized. As regards designs this period of trial seems to have been largely confined to Basket Maker III times, for by now it was standardized. Methods of manufacture appear to have been developing, as illustrated by both neck coils and the tendency to globular as well as more formal shapes. Thus Pueblo I people were apparently still much interested in ceramics and were seriously struggling with the problems of this medium.

So few black-on-red types of this period have been found, either in sherds or whole vessels, and so little study has been made of them that they can only be mentioned here. The paint is a lustrous black on a clear red slip. What few designs of this type have been examined by the writer seem to contain many of the elements of the preceding black-on-gray types. It does not yet occur in sufficient abundance to be considered a typical Pueblo pottery.

This raises the natural question of why and how the Pueblo people developed the distinctive technique of firing by a reducing atmosphere. If they acquired knowledge of pottery making from the Mogollon or Hohokam groups it might be assumed that they would also secure specific firing information and produce brown and red types. As they did not do this, at least to any extent, it is quite likely that they learned of pottery before they were sufficiently in contact with either of these groups to learn exact methods. Such an idea is strengthened by the finding of what is obviously a trade pot in a Basket Maker burial in the four corners area. Individual experimentation in firing led to the use of a reducing atmosphere. As no specific information is to be had on actual firing methods the most that may be said is that in the plateau area a knowledge of pottery preceded definite knowledge of how it was manufactured.

By way of a final comment it might be mentioned that in the eastern San Juan and Little Colorado areas the black-on-white pottery, which is found in the company of neck-corrugated vessels, shows a more Basket Maker III cast, as regards designs, than does that to the west. There is also a difference in black paints, which contained more iron in the east than in the west. This peculiar ceramic mixture has led to much

difficulty in determining and correlating definite culture stages in the two areas.

Although house types of the preceding period show considerable variation those of the present are even more varied. Two definite types of structure were in use. These are shallow pithouses and surface masonry structures. Dr. Cummings considers the rectangular pithouse to be the most characteristic house of the western San Juan at this period. Guernsey describes the house as varying from rectangular slab-lined pithouses to surface masonry rooms. Both these individuals are probably correct, for this was certainly a period of transition, when many traits were rapidly changing, and it is most likely that some surface structures were being made in this western section. In the Hopi country, the Colorado River drainage area, and perhaps the western San Juan, rectangular pithouses lasted quite late, but in other sections of the plateau they seem to have been of only short duration between circular pithouses and surface structures.

The rectangular pithouse is relatively shallow in comparison with its size, being from a foot to three or at the most four feet deep, and from ten to twelve or a maximum of about fourteen feet in length. The most characteristic type of roofing had a quadrilateral post support. This made a structure with a rectangular roof and almost perpendicular sides. Various attempts were made to reinforce the side walls with rocks, clay, wattlework, and even adobe "turtle backs." It is felt that these efforts soon developed true masonry and made it possible for the house to emerge from the ground and be built entirely upon it.

The rapid development of surface masonry rooms might well explain the report by Guernsey of circular slab rooms in loosely organized groups at Sa-a-kim village. A quick transition from this type through the rectangular pit form to the surface structure would account for his also finding associated square-cornered rooms above ground. These were of adobe and stone masonry, and were roughly grouped into communities, both in the open and in caves. A somewhat comparable situation was reported by Roberts in the Piedra River area. Here he found pithouses singly and roughly grouped together into small units, about what appears to have been a kiva structure. They were very shallow, almost surface rooms, and contained corner posts. The kivalike structures are very suggestive of pithouses, and are of circular form but with four posts supporting the roof. A similar arrangement has been noted in the Flagstaff area and the Tsegi country, in which the pithouse or

kiva is assumed to have been the dwelling and the surface structures granaries. However, these are found to be two hundred or more years later in actual dates.

Kidder in his *Introduction to Southwestern Archaeology* describes the house form as varying from round pithouses through oval to rectangular. The walls may be slab lined or clay pastered and further built up by

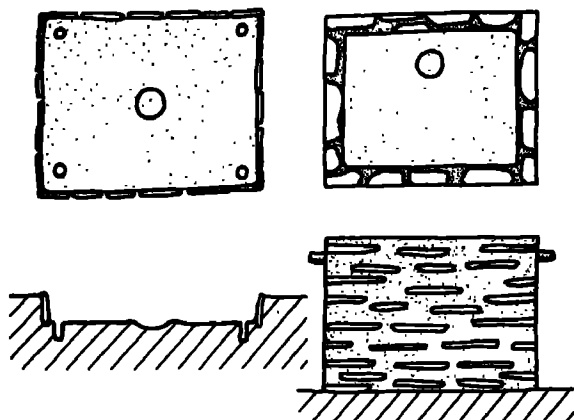
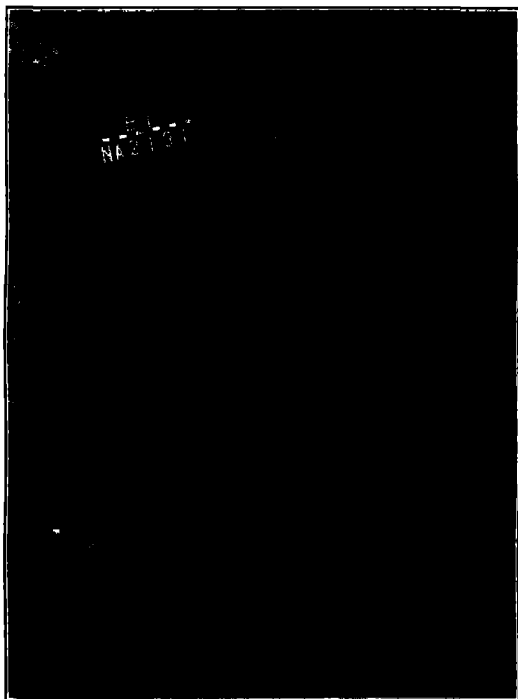


FIG. 105. House types vary most typically from shallow rectangular pithouses, often slab lined, to single-room surface masonry structures. The type of masonry shown here is of the western San Juan area, wherein flat rocks are used sparingly in a mass of clay. To the east more closely laid masonry was typical.

compact lumps of clay or plastered wattlework. The roof forms he describes as either conical or pitched and clay covered. He reports circular subterranean chambers which he feels are the ancestors of the later kiva. In his excavations in this section Dr. Cummings has also noted these circular, partly subterranean, proto-kivas, but has ascribed them to the Basket Maker III Stage.

In Chaco Canyon Judd found two circular pithouses which contained unmistakable Pueblo I pottery. One of these was of the type already illustrated in the chapter on Basket Maker III, as it had a surrounding bench into which the posts were seated. In the Lukachukai Mountain region the writer noted several circular clay surface rooms in caves, perhaps granaries, which it was felt at the time belonged to this period. In the Puerco section Roberts found circular, some almost rectangular, pithouses which belong to this period.

From this it is apparent that the house types now ascribed to this time and culture vary from circular pithouses through rectangular to surface masonry rooms. The first of these surface houses were single rooms, or at the most loosely knit groups of three or four rooms. They are associated with a larger structure which might be considered an early ceremonial chamber, or kiva. Possibly a good many of the simpler



Courtesy of the Museum of Northern Arizona

An extended inhumation found at Winona Village near Flagstaff. One pot had been included with the body as an offering. The numbers refer to the site and to the number of the burial, in this case site N.A. 2131, burial 1.

forms of houses are a result of local cultural lag, a feature which may be demonstrated in certain areas in later periods. The problem of most immediate interest is the location of the section in which the surface masonry house first developed. This took place in the San Juan drainage area and, from the distribution and comparative complexity, probably was to the east. This feeling is further strengthened by the

definite information that the great structures of many rooms in Chaco Canyon were far earlier than any structures of comparable size in the Southwest. The trait seems to have spread west through the San Juan and then south into other areas. In his most recent report Morris suggests evidence which would tend to substantiate this thesis. As will be noted later, masonry walls form one of the most distinctive traits of the Pueblo people.

The Pueblo I physical type has nowhere been reported in detail. Apparently all skulls were deformed posteriorly, for in the literature no definite mention is made of any other type. The skull shape appears to range from mesocephalic to brachycephalic. Guernsey describes the skeleton as light framed.

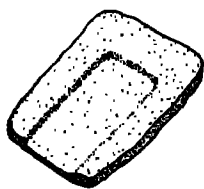


FIG. 106. The flat sandstone type of metate pictured seems to have been the most typical of this period. It is usually open only at one end, and has a lineal grinding surface.

Although burials are extremely rare the few that have been recovered are flexed. This corresponds to the earlier types of burials in the plateau area. They occur in caves, in rubbish heaps, and very rarely under the floors of rooms. The scarcity of material of this age and pure culture makes generalized statements regarding both physical type and burial customs none too reliable.

Pueblo I metates seem to have been of two closely allied types. By far the more common is made of a rather flat slab of stone with a depressed lineal grinding face open at only one end. The accompanying illustration shows such a flat sandstone metate. These are found in the eastern San Juan, locally throughout the Little Colorado area, and sporadically in the west. The second type is the trough-shaped metate open at both ends. This is found over much the same area, though more sparingly, and seems to have been most common in the west. *Manos* are of the block type.

Mauls are found to be relatively abundant in sites of this age. They are predominantly of the full-grooved type, although some three-quarter-groove forms appear. As these have already been described they will not be reviewed. Axes are characteristically of the full-grooved type. Quite a few are roughly chipped and show little grinding even on the cutting edge, but have a notch on each side for hafting. Ground forms, though rarer, are much more perfectly made and are like the types already described. All have relatively short bits.

Points are well made and well shaped. Flaking is predominantly fin-

ished by pressure, with the result that edges are much better controlled. The side notch is typical, and long, slender, delicate points are not uncommon. All are much lighter in weight, and most are smaller than atlatl dart points, although it is certainly conceivable that either might be larger or smaller than the other.

Baskets continued in much the same forms, weaves, and designs as those made previously. Guernsey reports finding an unusually fine carrying basket which had high triangles in red and black bands as an element of the design. Some analogy might be drawn between this example and the prevailing pottery decorations.

The true yucca ring basket was the main basketry contribution of this period. It is made by platting or twilling yucca leaves together into a shallow bowl-shaped mat. The ends of the leaves are then brought up inside a wooden ring, turned down over the outside, and tied. This results in a shallow basket which may be used as a sieve, and is identical in every way to similar baskets made today by the Hopi Indians.

The development of the ring basket and its steady increase in popularity parallels the rise of pottery. At the same time the larger of the coiled baskets decrease in number. This is perhaps the natural result of the substitution of one type of container for another, for with the development of ceramics, baskets, which were more tedious to construct, would become less popular than pottery.

Besides the types already mentioned, rush and reed mats were extensively made and used. These were abundant throughout all succeeding periods, being sometimes used as floor coverings, roof coverings, or even as storage-pit linings. Crushed cedar bark mats and bags do not seem to have survived.

Practically nothing is known about sandals. Guernsey pictures and describes one sandal with a rounded toe which he believes to be Pueblo I. It is quite likely that the finer woven types of the preceding period survived, at least to a slight extent. The weave of the one specimen pictured is twined.

Knowledge of cloth fabrics from Pueblo I is as limited as that of other perishable materials. Cotton was certainly introduced at this time, as fragments of cotton cloth have been found by several investigators. The question of the derivation of Southwestern cotton has been raised many times but never satisfactorily answered. A wild cotton grows in the southern part of the state, and it is possible that domestic cotton was derived from it. The fact that the Hohokam people are known to have had cotton at a slightly earlier date would indicate that the Pueblo

groups derived this material already domesticated from them. The origin of corn, which was an agricultural product of Basket Maker II, is even more vague. By now corn had become much more varied.



FIG. 107. Sandal type pictured by Guernsey, which he feels is Pueblo I.

Regarding hunting implements the only definite knowledge is that the bow and arrow replaced the atlatl and dart. The substitution took place late in the preceding period and had apparently become definitely established. Other hunting implements are not known, unless awls and the axe may be so classed.

Foods also are little known. As has been suggested, corn of several varieties was grown, and squash and beans were common. It is also quite likely that the turkey was still domesticated by at least those groups actually in the San Juan area, for turkey remains are found abundantly in later periods there.

Ornaments are not well known. Feathers undoubtedly still played an important part in decoration, but beads were more common and better made. Many are smaller than those of the preceding stage. A much greater use of turquoise was characteristic at least of the eastern part of the area.

In summary only a few traits are known to be distinctive of this stage of culture. Probably the most distinctive single trait is the corrugated-neck jar. Associated with this in more or less amounts is found the Kana-style of decoration, with very fine lines, attached dots, and high triangles. Regionally other black-on-white types show styles of design more nearly approaching Basket Maker III. The house varied greatly in the several regions, so that no one form may be said to be typical. The metate is of two types, the most important innovation of which is the establishment of a definite lineal grinding surface, often open only at one end. Other cultural material is too mixed with that of other stages or too little known to draw sweeping conclusions.

One other question should be discussed before going on to later periods. The traits constituting Basket Maker Culture have already been summarized and form a long and impressive list. Certain traditions of artistic and utilitarian endeavor have been pointed out, particularly in weaving. Gourds hung in nets and baskets formed the main container group, and fabrics of many sorts were manufactured. Houses were at best unimpressive habitations. Pueblo Culture saw a shift of interest in all these respects. Houses almost immediately became much elaborated

and moved up to the surface of the ground. Stone masonry soon became a most characteristic trait. Pottery developed to such an extent that it began to replace other containers and formed a new avenue of artistic expression. Baskets were still made, but in far less numbers. The introduction of cotton as a fiber suitable for weaving made possible certain soft cloth fabrics that were not known previously, and the use of human hair or yucca and apocynum fibers became less. The bow and arrow, becoming a more efficient weapon for hunting and warfare, widened the sphere of such activities, and the substantial house made life possible in any area and under almost any conditions. This is well illustrated by the fact that almost no Pueblo I sites have been found in caves.

Specifically the features which the writer feels may be ascribed to Pueblo Culture are the following:

1. Pottery fired in a reducing atmosphere.
2. Coiled and scraped method of finishing pottery.
3. Corrugation as a surface decoration in pottery.
4. Specialization in masonry. (This is the only group in the Southwest which developed true masonry techniques.)
5. The kiva or other ceremonial structure.
6. The deformed head.
7. Quite likely the full-grooved axe, although this may have been a Mogollon trait.
8. The scoop-shaped or lineal metate for grinding.

Traits which were introduced at this time, perhaps from the Southeast, either from the Mogollon or Hohokam, are the bow and arrow, cotton, beans, and more varied corn.

Recently there has been a tendency on the part of some archaeologists to group Basket Maker and Pueblo Cultures together and to refer to them under the name of "Anasazi." In the above discussion an indication is given of how distinct the cultures of these two groups are, although, of course, certain traits may be expected to carry over from one to the other. Even though there is a definite relation between the two this is more a matter of geographical location than of material trait affinity. The traits which have been pointed out as distinct and typical of each are basic, or of such a nature that they have affected the traditions of the groups. Those which carry over are largely of such a generalized nature that they are to be found in almost all primitive cultures, here or elsewhere. Certainly the affinity found between these two people is no closer

than that between Mogollon and Hohokam. If such a term is used for the Basket Maker-Pueblo groups, with an implication of genetic affinity, then one must be applied to the Mogollon and Hohokam. If, however, it is used primarily in the geographic sense, in the manner of the term plateau, to imply those people who occupied the eastern and central portion of the plateau, it becomes definitely useful. Since all the cultures in the Southwest may be shown to be somewhat related the writer is inclined to disregard this term, particularly in such a basic discussion as this, for its acceptance would necessitate the use of a good many similar confusing terms.

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Chapter XVIII

DISSEMINATION PERIOD A.D. 900-1100

PUEBLO II AND III

In the preceding chapter it has been shown that relatively little is definitely known concerning the Adjustment Period and Pueblo I Culture. More is known about the cultures which flourished during this, the Dissemination Period. Accurate dates have been secured from a large series of sites of this time and from all major divisions of the plateau area, so that culture variations are abundantly dated. With more certainty than for any preceding period it is therefore possible to state that the beginning was A.D. 900 and the end 1100.

An examination of the accompanying map will indicate the extent of the area occupied during this period. The area of greatest concentration is now the largest and the most continuous of any time in the plateau. The entire plateau was covered by a large number of individual houses or villages so that the total population has been estimated as the greatest of any time in this section. A comparison with the map of the preceding period will indicate the extent of this expansion. The area of

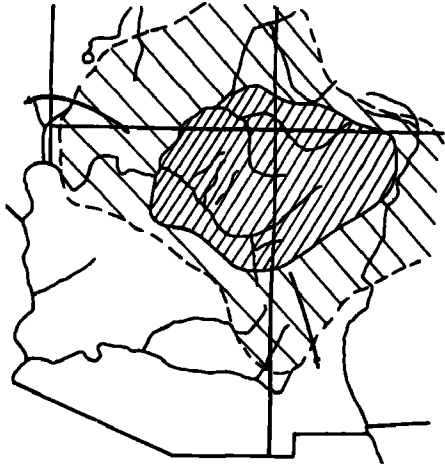


FIG. 108. Outline map indicating the area occupied during the Dissemination Period. The area of concentration is greatly expanded from the preceding, and in fact is the largest of any time in Pueblo development. Influence was widespread as shown by the arrows to the west and south. The area of sites showing traces of this culture was probably even greater than that indicated.

maximum spread is also much greater than that of the preceding period, and possibly of any succeeding period. Strong influence went south through the mountain section, eastward into the Rio Grande drainage, north into central Utah, and west through Nevada to California. Such an expansion is indicated by the presence of pottery types obviously traded from the central area of concentration, and it may be assumed that with these trades went other influences.

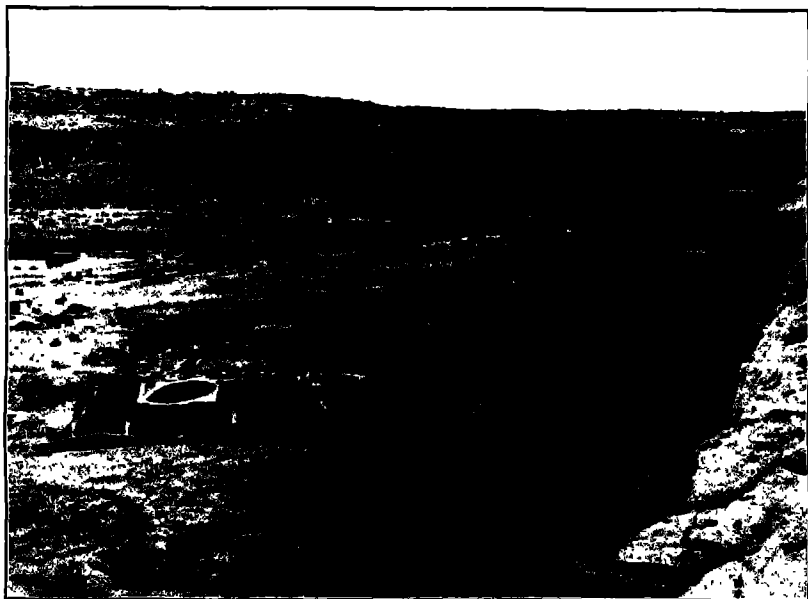
Cultural variation in the several regions of the plateau is marked, probably the two extremes being found in the Flagstaff area to the southwest and the Chaco Canyon area to the northeast. As will be shown shortly, house types vary from one-room pithouses to multi-storied, multi-roomed pueblos, and general culture from a Pueblo II to a Pueblo III stage. The most rapid development in the plateau certainly took place in the eastern San Juan, so that for at least four hundred years the people occupying this section were actually the leaders of Pueblo development.

Pueblo II has been defined by the Pecos classification as a widespread geographical expansion of life in small villages, introduction of corrugated pottery, often elaborate and with designs over the whole surface of cooking vessels — and to this has been added Black-on-white pottery characterized in general by simple designs in wide lines, long flattened triangles, rudimentary interlocking frets, and occasional attached dots. Pueblo III Culture has been defined as the classic period of large communities, great development of arts, and local specialization, the first introduction of polychrome wares into pottery, and in many cases the best pottery produced during any period, with a general marked decrease in the importance of corrugated wares.

From these definitions it is obvious that an attempt was made to inject a definite time relationship into this classification, but as has been pointed out by several writers it cannot be so applied to this period in the plateau. Culture is far too variable to be classed as the same, or even closely similar, from the Flagstaff and Chaco Canyon areas, and other, less striking and gradual variations of traits may be found between these two sections. As the discussion progresses it will be possible to point out certain consistent uniformities. At present it is probably sufficient to suggest that the most commonly consistent single trait appears to have been the production of cooking vessels which were covered completely on the outside with corrugations often forming indented geometric patterns. Certainly polychrome pottery was not definitely introduced now, and with equal certainty such a site as Pueblo Bonito gives every evi-

dence of having reached a stage of culture of large communities, great development of the arts, and local specialization.

Since one of the first prehistoric sites to be dated accurately was Pueblo Bonito, and since the culture found at this site had been recognized as Pueblo III, it was with considerable surprise that the Museum of Northern Arizona finally succeeded in dating single-room pithouses as of almost identical time and duration. Once the validity of this dating



General view of Pueblo Bonito. The D shape is apparent. Walls are standing to a height of four stories. The great kiva and the many smaller kivas may be noted.

had been demonstrated it became obvious that culture variation was extraordinarily great, and many archaeologists have since been working in an effort to explain this discrepancy. Two things are obvious. First, Chaco Canyon was definitely the cultural leader at this time. Second, the influences responsible for regional variations in rate of cultural evolution did not all come from the same source.

Of all traits the most consistent and diagnostic time indicator is corrugated pottery. This pottery was apparently evolved as a means of decoration on the utility types. The earliest form is a medium-sized large-mouthed jar, in which indented corrugations form a band only

in the neck portion. This is obviously an evolution from the neck-coiled type of the preceding period, in which the end of the thumb was used to pinch the coils together at regular intervals. The indentations characteristically show thumbnail marks, and are large, deep, and regular, invariably slanting diagonally. Almost immediately the idea of corrugating the entire surface of the vessel seems to have been developed, so that the same types of large coils and deep indentations were produced. This type dates sometime near A.D. 885. See the upper left-hand figure in the illustration and the lower left-hand detail of coils.

By 900 the technique of indented coiling had been much improved by the use of smaller bands and offsetting the fingernail marks. Coils still covered the entire pot, with the exception of a large flattened band which formed the rim. Smooth bands were also sometimes left to form geometric patterns, particularly triangles. Forms with this style of decoration are jars, pitchers, and rarely bowls the inside of which has a black-on-white design.

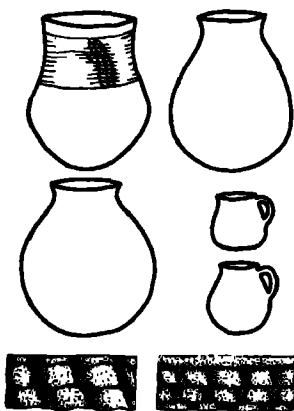


FIG. 109. The most distinctive pottery type is the corrugated which is deeply and evenly indented, sometimes in geometric patterns. The upper left figure is the earliest indented corrugated form, a detail of which is shown to the lower left. It has large deep indentations. The other forms and the detail are typical of Tusayan Corrugated.

tempering material. This latter type is found throughout the eastern San Juan and down the Little Colorado River to about the vicinity of Winslow.

Various writers have suggested that indented corrugations were made not only as a form of decoration but also to serve a definite utilitarian purpose by increasing the surface of the outside in relation to that of the inside of the vessel. This, it is felt, would gather heat over a large

The most abundant type is Tusayan Corrugated. The paste is gray and has relatively coarse angular sand temper. The inside was scraped but never slipped; the outside is completely covered with small, deep, regular corrugations. Because these pots were used primarily for cooking, the outside was often coated with a layer of carbon, so that they are occasionally described in the literature as black. Through the western part of the Hopi country, the Flagstaff and the Tsegi areas, temper is sand as described; to the east, a greater use was made of prepared angular light fragments as a

area and concentrate it in a much smaller area on the inside of the pot, thus making the contents cook more rapidly than in a vessel with a plain surface. In the opinion of the writer this credits the makers with more reasoning intelligence than they probably possessed in such a matter.

In the western portion of the area under consideration Deadmans Black-on-white assumes an almost equal importance in dating. Although this specific type was relatively restricted in manufacture it was widely traded, and the style of design was very generally used. The time of duration was from A.D. 900 to about 1125. The paste is gray with sand temper. Vessels are covered with a white slip, and a clear black carbon paint was used in the decoration. The inside of jars and the outside of bowls are scraped and sometimes not slipped. In the order of abundance the common shapes are bowls, jars, pitchers, and ladles. Designs are always relatively simple, characteristically occurring in zones or bands. The elements are lines about a quarter of an inch wide, low triangles with dots on the long side, and occasional dots on the lines. The prevailing style of decoration was to use ribbonlike lines in simple design patterns. See Fig. 110.

So far all pottery types which have been described in detail from the plateau area were fired in a reducing atmosphere. Now, for the first time, two black-on-red types occur in sufficient abundance to warrant detailed descriptions. The first of these is Deadmans Black-on-red. The paste is yellow, often containing a carbon streak, and is predominantly tempered with angular sand. Surfaces are well polished and slipped a bright red. The paint is a manganese type, producing a clear black sometimes grading to a dark purplish color. In the order of importance forms are bowls, seed jars, jars or jugs, and ladles. A distinctive feature is that decoration is often polished over before firing so that it is slightly blurred into the slip. It will be recalled that some of the Mogollon types were also treated in this manner. Design elements are coarse lines, wide or ribbonlike lines, and triangles. These are also very

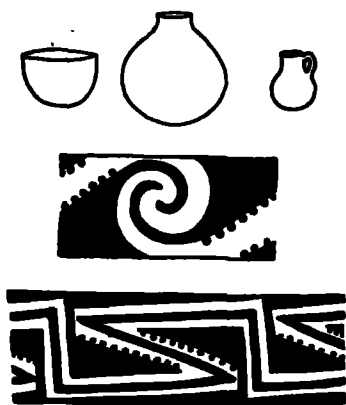


FIG. 110. One of the most typical and best dated types is Deadmans Black-on-white. The forms are bowls, jars, and pitchers as shown above. Two variations of design are shown. The upper is perhaps an earlier form.

slipped a bright red. The paint is a manganese type, producing a clear black sometimes grading to a dark purplish color. In the order of importance forms are bowls, seed jars, jars or jugs, and ladles. A distinctive feature is that decoration is often polished over before firing so that it is slightly blurred into the slip. It will be recalled that some of the Mogollon types were also treated in this manner. Design elements are coarse lines, wide or ribbonlike lines, and triangles. These are also very

suggestive of the Mogollon. This type began well before the start of this period but lasted only to about A.D. 950.

Tusayan Black-on-red is the second type. It also has a yellow-orange paste, but the temper is made up of soft, light, angular inclusions. It is usually well polished, the outer surface of bowls being sometimes slightly lumpy, and is slipped with a bright red slip. Designs, formed with manganese black paint, were applied in narrow and wide lines and hatched areas. Hatching is a markedly new feature in this area. Dates are roughly from A.D. 900 to 1125.

Although a great many other pottery types are known and described from this period it is impossible to discuss them in detail here. An

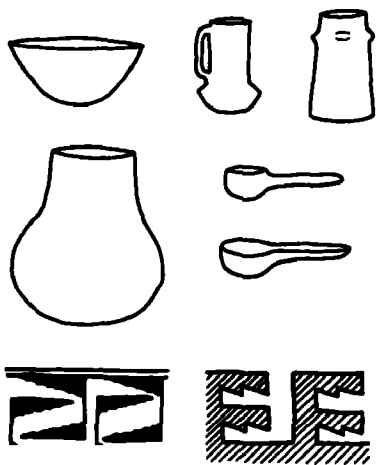


FIG. 111. Chaco Canyon Black-on-white pottery is equally distinctive both in form and design. Bowls have pointed rims and sloping sides. High-neck pitchers and vases are characteristic. The bat wing and fine hatched elements are also typical in designs.

abundant literature will be found on this subject by those who are interested in following it further. By way of contrast the most common types found in the Chaco Canyon area will be treated next. Corrugated types are so similar to those already discussed that they need not be described except by noting that the lower left-hand figure in the accompanying illustration shows the most common form. Black on reds rarely occur, and are mostly Wingate Black-on-red. It is therefore in Chaco Black-on-white that the most outstanding characters are found. This type has a gray paste and light, angular, prepared temper. The vessels are scraped, and some bowl exteriors are not completely slipped. The surface is rubbed relatively

smooth and covered with a paper-white slip. Decoration is in a carbon iron black pigment, which sometimes oxidizes to a red or brown upon secondary or accidental firing. Both forms and designs are very distinctive. The most common forms are bowls with sloping sides and pointed rims, pitchers with small bodies and high necks, vases with small horizontal handles or lugs, and ladles with open handles. Designs may be characterized by a use of fine lines, particularly in hatched areas, where the surrounding lines are character-



One of the early rectangular pithouses with a ventilator passage and a four-post roof support which was excavated by the Museum of Northern Arizona near Flagstaff.

istically much heavier. Low triangles with serrated edges, called "bat wings," are also a common element, as are wide bands along the rim of bowls. On a whole the pottery is well made, but the slip gives the appearance of being delicate or impermanent and is often light.

House types show equal or greater variation. The simplest type is found in the Flagstaff area, and for that reason the discussion of houses will begin here. The most characteristic house is a deep rectangular pithouse which has four corner posts, a central firepit, ladder entrance, and a ventilator. These structures are relatively deep and in certain features suggest Mogollon influence. Those found in forested areas were lined with wood, as in the accompanying illustration. Probably the most outstanding feature is the use of split planks as a wall lining, and split shakes in many as a roof cover under the clay. Just how the logs were split with primitive tools remains a question, for they were formed by splitting the log across the rings, or from the outside to the center, and not parallel to the surface

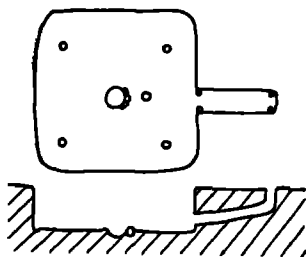


FIG. 112. The Flagstaff type of pithouse is relatively simple. It is rectangular with four corner posts, central firepit, ladder post, and ventilator.

along the rings. So many of these houses have been dug and reported in the vicinity of Flagstaff that almost all variations are known.

The deep wooden pithouse gradually gave way to an equally deep masonry-lined structure in this section. Associated with this latter type are small surface masonry rooms, three or four grouped together, which

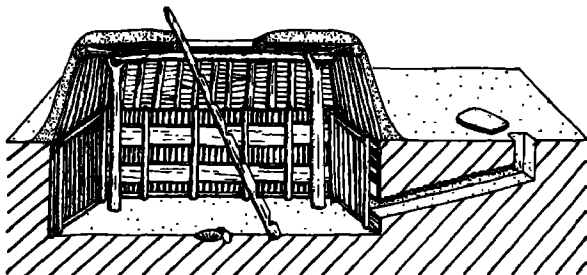


FIG. 113. Reconstruction of one of the wood-lined, Flagstaff-type pithouses. The entrance hatchway also served as a smoke hole, and the ventilator could be blocked outside with a stone. Poles, split planks, and shakes were all used as lining and roofing materials.

were probably granaries. Sometime shortly after A.D. 1100 it seems to have altered to the small unit type of surface structure. From this time on the Pueblo prevailed.

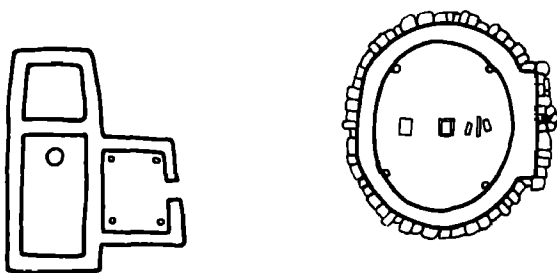


FIG. 114. At Heiser Springs, near Wupatki Pueblo, a sunken kivalike house was found associated with three small surface rooms. It is felt this structure was the main dwelling. It had four support posts, a banquette, a platform, ventilator, central firepit, and ladder entrance, all features strongly suggesting the formal kiva of the east.

A few miles east of Flagstaff, at Heiser Spring near the Little Colorado River, three small surface rooms and a kivalike pit structure were excavated by the Museum of Northern Arizona. The pithouse is obviously of the most interest. It is relatively deep, oval in form, with a banquette or bench, and a small platform on one side. Floor features include four support posts, a ventilator, deflector, firepit, and floor opening in line,

and a base rest for a ladder through the roof hatchway. It is felt that this kivalike room actually was the dwelling while the surface rooms were utilized for storage only. Similar structures are found in the Tsegi Canyon at a slightly later date, about A.D. 1130, and are believed to have served the same purpose.

If such an arrangement actually is a pithouse and three surface granaries, it is surprising that it should have been oval in form when all other pithouses in this section are rectangular. It is also surprising to find it in such close proximity to the rectangular-pithouse type described above. The obvious answer is that even at this time distinct ethnic groups had become sufficiently established over most of the plateau that two slightly different cultures existed close together and contemporaneously. In the western San Juan similar structures are known to have existed to as late as A.D. 1130 and this site is probably a southern extension of this type. There is, however, always the slight possibility that such a structure is actually an early local ceremonial form, and hence primarily a kiva. Farther to the east, in the center of the Hopi country, present evidence indicates that houses were masonry-lined pithouses with either a D or rectangular outline.

On going farther northwest, into the Mesa Verde section of southwestern Colorado, one of the most interesting house types is found. This has been described and pictured by Prudden, and named the Small House. The main dwelling is a small, compact one-story unit of surface dwelling rooms. The masonry is excellent, in fact much of it is true masonry in the sense that the walls are narrow and the stone blocks extend through from one side to the other. The blocks are also carefully chosen and somewhat shaped, forecasting the remarkable stone work of the succeeding period here. Associated with these small dwelling units are found definite subsurface kivas.

The kiva is relatively small, twelve to fifteen feet in diameter, and is circular except for a platform on one side. The wall is lined with a bench or banquette upon which rest six or eight stone pilasters. These pilasters supported the roof, which was formed by placing poles across them from one to another. Additional poles were placed across the angles thus formed until a dome-shaped roof was constructed. Important floor features consist of a ventilator extending under the platform, a deflector, central firepit, "sipapu" hole in the floor, and in some a second underground entrance connecting with one of the dwelling rooms. The sipapu, found in some historic kivas, is regarded as a symbol representing the mythical opening into the underworld through

which the ancestors are supposed to have reached this world. This type of kiva is very similar to the later type in the Mesa Verde region.

To the south, in that area lying between the Little Colorado, Zúñi, and Puerco Rivers, Roberts has reported a medium-sized surface Pueblo structure of about forty-five rooms and four kivas. This site apparently

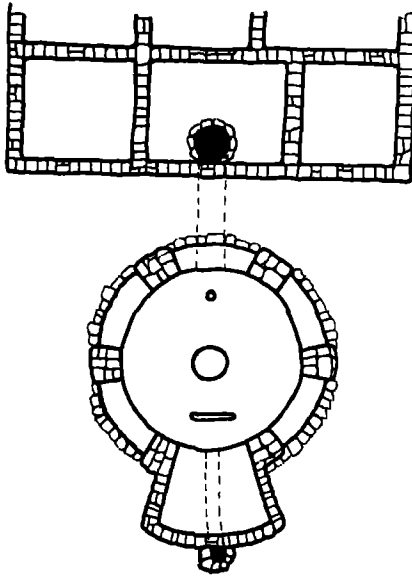


FIG. 115. In the Mesa Verde area at this time structures like this are apparently found. The house is a small unit, never over one story high. The kiva typically has a banquette, pilasters, platform, ventilator, deflector, fire-pit, "sipapu," and sometimes a passage leading to one of the rooms of the house. This is Prudden's unit type of house.

belongs to this time for ceramic characters would seem to be related both to Deadmans and to Chaco style in black-on-white types, and corrugated pots are of this age. The site is of particular interest because it appears to have been made up of relatively small more or less square blocks of rooms, each including one kiva. The walls of the earlier section, although above ground, were made of adobe; those of the later portion were made of rock. The earlier kivas are inclined to a D shape, but those of the later sections are definitely round. To the writer this site forms the link between the unit-type house of the Mesa Verde area and the huge pueblos of Chaco Canyon.

Beyond any question the most impressive site in the entire Southwest at this time was Pueblo Bonito. Not only is it the largest masonry structure made to this date, but it was ob-

viously planned and executed as a definite unit. The earliest portion was in much the same form as the final completed structure. The presence of a great many circular kivas as well as a few extraordinarily large kivas is of particular interest.

Although Pueblo Bonito is the largest pueblo in this group there are many more similar pueblos near by. Architecturally these sites are noteworthy because of their size, not only as regards the pueblo as a whole, but also in the extraordinary thickness of the walls and the size of the rooms. The walls of all structures are filled with rubble on their in-

teriors and with carefully coursed and shaped sandstone blocks on their exteriors. The typical pueblo surrounds a court, with the highest stories at the back, which form a blank wall, and with a line of one-story rooms cutting off the fourth side. The total height of rooms at the back is usually three or four stories. Within the court are the kivas, always one great kiva and usually several other smaller ones.

The kivas are of two types.

The great kivas are circular in form and from forty to sixty feet in diameter. A wide masonry bench encircles the room, and in the center is a raised fireplace, on either side of which are two sunken masonry-lined rooms. The roof was primarily supported by four large pillars near the center. On the north side is a stairway cutting through the banquette from the floor to a large room on the ground level, and surrounding the structure are a series of surface rooms.

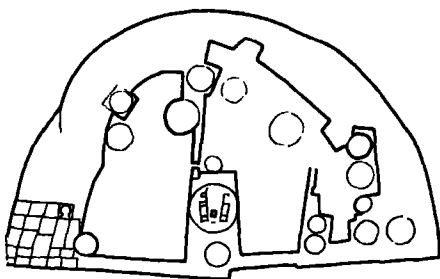


FIG. 116. Pueblo Bonito was unquestionably the most outstanding site of this time. The illustration is only a rough outline of the block of rooms, the relative sizes of rooms being indicated in the lower left-hand corner. Position of kivas is indicated by the roughly sketched circles, with an indication of details included in the largest.

The smaller kivas seldom exceed twenty-five feet in diameter. A banquette supporting six pilasters runs around the wall. On the south a ventilator opens to the outside and runs under the floor to near the firepit. To the west of the firepit is often found a single small masonry vault.

Though there are several of these large pueblo ruins in the Chaco Canyon area there are also a great number of smaller, more isolated sites of comparable age. These smaller sites would roughly correspond to the suburban villages clustered about our own great cities. Some of these sites are in themselves relatively large, but many of them are only of one or two rooms. The smaller ones probably represent the agricultural peasants who through choice or necessity repaired to more remote regions. The amount of food necessary to support life in one of the large villages must have been considerable, and it is thus equally possible that during certain seasons a part of the population removed to the smaller sites to grow the required foodstuffs.

Pueblo Bonito has been accurately dated by a large number of beams as existing between A.D. 919 and 1130. The first is such an early date

that one is inclined to wonder if most of the site was not built late in the period. Information as to the location of dated beams, however, shows that a large part was built in the tenth century, and that the plan originally begun was simply further carried out and expanded. As a result one must admit that multi-roomed and multi-storied pueblos,



A small masonry-lined pithouse dug by the Museum of Northern Arizona near Flagstaff. The ventilator leading under the wall and the upright slab deflector before it may be noted.

with highly formalized masonry and the wide use of horizontal beams supported by walls, were well known at this time. It is for this reason that the previous suggestion has been made that masonry developed somewhere in this eastern section.

The great sites of Chaco Canyon seem to have been about as far advanced in other culture traits as they were architecturally. For the construction of such large and well-planned villages it would have been necessary to have a compact, functional, and well-directed social organization. Other objects appear to have been comparably developed, so that a high specialization of arts and crafts must have been the rule.

It is the opinion of the writer that cultural evolution naturally progresses, with population increase, to the point where individual special-

ization is inevitable. In small scattered communities this is impossible, for there is no outlet for specialized industries. In such circumstances each individual must produce all or most of the objects used by his own family. With population increases, and clustering in large communities, such an outlet is available, and specialization results. Such a population increase, localization of population, and specialization in arts had obviously taken place by this time in the Chaco area. Probably next in this respect was the Mesa Verde section and those areas in the headwaters of the San Juan lying north and east of the four corners. With the appearance of the more complete report of Pueblo Bonito by Judd it is hoped that many of these problems will be clarified.

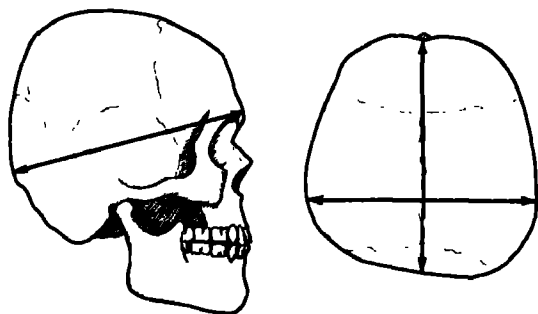


FIG. 117. The Pueblo physical type is definitely deformed posteriorly, as in the above illustration. For comparison to Basket Maker type see Fig. 82. The skull pictured is an extreme example of deformation, and is practically as wide as it is long. Such an extreme specimen is not common.

Although the physical type has nowhere been described in detail it was substantially broad headed. Deformation of the skull was practically universal and appears in many individuals to have been very marked. Almost invariably this deformation is not well centered on the back of the head, but is slightly to one side or the other.

The base of the cradle is similar to that of the Basket Maker type already described and pictured, which was covered with reed or leaf matting. The head of the infant appears to have often been supported on a hard block which thus deformed the skull during its growth. Another type was made of two boards tied together upon which the child was strapped. For the first type at least the descriptive term of hard cradle is somewhat misleading, for the cradle was firm but within itself not hard, except for the head rest. Burials of Pueblo II Culture and of this time have been found near Grand Falls on the Little Colorado River

with the head resting on a hard rock, suggesting that it had served as a sleeping support. If such objects were in general use they would account for the radically deformed skulls which are so typical.

From very incomplete data it would appear that the typical burial was flexed and placed on one side or the other. Burials are most commonly found in refuse heaps or similar locations where digging was relatively easy.

Metates, like those of the preceding period, were of two types. The eastern form is the scoop-shaped metate, open only at one end; the western form was mostly trough shaped. As has been pointed out, these two types overlap and are mixed together in the San Juan and Little Colorado areas. At about the end of this period flat slabs appear to have been introduced, or developed, which were fitted into boxes formed by setting three flat stones on edge around the grinding stone. The block type of mano is by far the most typical and common, although some triangular or wedge-shaped manos are found.

Axes, not particularly abundant, are of two types. The full-grooved axe was possibly made in some areas to about this date but was never anywhere very abundant. The three-quarter-grooved axe was by now quite well established in the plateau area, in all sections with the possible exception of the middle and lower

portions of the immediate San Juan River. Mauls are of both full-grooved and three-quarter-grooved types.

Sometime during this period large circular or rectangular lignite buttons appeared in the Pueblo Culture. Such a button is illustrated in Fig. 120. The closest parallel is to be found in the pyrite mirrors of the Hohokam Culture, and it is quite possible that they were derived from this source. As pyrite was not easily accessible in this northern area, or was not used by these people

for other objects, it is likely that they would substitute the black shiny material and make similarly shaped and highly polished buttons. Strength is lent to this theory by the recent finding of strong Hohokam influences of this date in the Flagstaff area at Winona Village.

Arrow points although somewhat varied are predominantly trian-



FIG. 118. Arrow points at this time were typically triangular. The two end forms are from the Flagstaff area; that at the left is probably Patayan. The two central forms are from the east. Notches are either lateral or from the corner.

gular in form. Both lateral and corner notches were characteristic. In the Flagstaff area a long slender point with distinctly serrated edges may probably be ascribed to the Patayan Culture, although it is very similar to the slender Hohokam point. The more triangular point with side notches is also found here though less commonly. A similar heavier point is found in the Tsegi area, while the corner-notched type is reported from the Puerco section.

Basketry is represented by the two types already described. The twilled yucca ring basket was now well established. Coiled baskets are not abundantly reported, although they must have been relatively com-

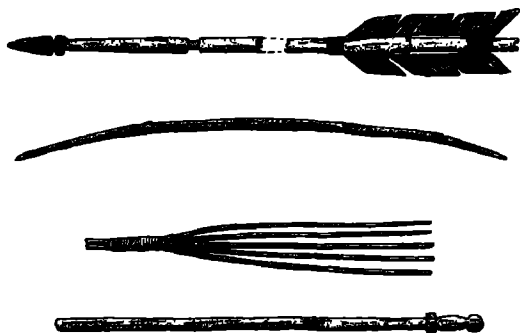


FIG. 119. The arrow at this time was made of a reed with a hardwood foreshaft, and characteristically had three feathers, as in the above illustration. The bow was short and relatively simple. The obvious beaterlike implement made of five sticks tied together was possibly used in flailing cotton. The wand pictured at the bottom is from Pueblo Bonito and has been considered ceremonial.

mon. Those specimens which the writer has examined are of the two-rod-and-bundle type, with stitches which are not split. This is the type already declared typical of the Basket Makers, and in fact the same forms, with the exception of the large flat basket, were made. Light matting of reeds or leaves was common, although the thick Basket Maker type of matting is apparently lacking.

Because of the open nature of most of the sites of this period sandals are completely unknown from any area other than Chaco Canyon. Here several examples were found which are of the rounded-toe and notched-toe types characteristic of Pueblo III Culture. As these will be described in some detail in the next chapter they will not be discussed here.

Unfortunately almost nothing is known of cloth fabrics. Fragments

have been recovered which probably are of this age, but no very large pieces are reported. From them it is possible to suggest that quite large fabrics were woven, and if they were, they would certainly have required a true vertical loom. Diagonal weaving was known, and red and black were both used with white to produce color combinations. The beater pictured in Fig. 119 was probably used in beating out the bulk cotton to separate the seeds from the fibers, and to orient the fibers somewhat.

Hunting implements are restricted to the bow and arrow. The arrow is of particular interest because, like the atlatl dart, it was made in two pieces. The main part of the shaft was a light reed, which was plugged in the notched end. To this end were attached three feathers to aid in directing flight. The other end was left hollow, and into it was fitted the hardwood foreshaft, which was pointed and often shouldered. The stone point was attached to the foreshaft. Arrows are much shorter and lighter than atlatl darts. The bow is relatively short and poorly made, the example illustrated being typical. The rabbit stick also appears to have been in use. This is a flattened bent stick, somewhat suggestive of the Australian boomerang, which was sailed after a fleeing rabbit to strike it down from behind. Such sticks are in use by Hopi Indians today.

So few specific data concerning foods are available that it is impossible to speak with authority on this matter. Certainly corn, beans, and squash were all grown and eaten. Turkeys were probably still domesticated in some areas. Animal foods included a large variety, although an even greater use seems to have been made of smaller rodents.

Ornaments are of special interest. Stone carving of such ornaments as pendants reached a high level, particularly in the Chaco area. The use of inlays, especially turquoise, became equally prominent now. The finest examples of both these styles of work come from Pueblo Bonito, where the two objects pictured were found. As this is the earliest period when a marked use was made of this technique the writer feels that it is one of the peculiar contributions made by the Pueblo people to the culture of the Southwest. Fine disk stone and shell beads were also made in some abundance, and larger similar clay beads are not uncommon. Shell pendants are not distinctive, but carved stone pendants, often in the form of animals or birds, are strikingly well done. From both Chaco Canyon and the Flagstaff area copper bells are reported, but most likely these were imported rather than made locally. Pipes are of the tubular form, and at least in some localities are of the short-stemmed type.

Bone and horn objects are about the same as those already described. They consist largely of awls, fleshers, and similar tools. Tubular bone beads do not appear to have been characteristic.

Ceremonial objects are not well known. At Pueblo Bonito certain slender wooden staffs are assumed to have been made for such ceremonial purposes, but the relegating of such objects to the ceremonial category is at best somewhat uncertain. See Fig. 119.

In summary it is possible to point out certain features which are typical of this period. Of these the most outstanding, and the best time indicator, is the over-all indented corrugated pot, in which deep indentations, sometimes in patterns, are characteristic. Black-on-red pottery for the first time has become important in Pueblo Culture and was undoubtedly made by these people as well as their white and gray reduced types. Black-on-white pottery may be characterized by the introduction of the first fine hatching in the east and north, and by a common use of wide lines and low flat triangles in simple designs. Physically, the head is consistently deformed posteriorly and is mostly broad. Points are predominantly triangular in

shape and commonly side or corner notched. Houses are the most varied of all traits, running the gamut from rectangular pithouses to multi-storied and multi-roomed pueblos. The kiva was well developed and formalized with a series of distinctive features, some being of extraordinary size. No polychrome pottery is typical of this period.

A few further suggestions might be made by way of a series of summary comments. Masonry and associated architectural features seem to have developed first in the east, or perhaps the four corners area. The largest houses, as well as the largest kivas, were first known here. These influences extended west through the San Juan and Little Colorado Rivers. Many other influences may be demonstrated. Hohokam people extended the sphere of their culture first into the Flagstaff section and

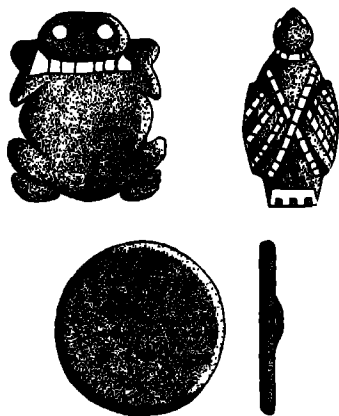


FIG. 120. Stone ornaments became very elaborate at this time. The two upper figures are examples of stone carving and turquoise inlay from Pueblo Bonito. The bottom figure is one of the lignite buttons found in the Tsegi country. It is probably a local copy of one of the pyrite mirrors found in the Hohokam Culture.

then apparently northward as far as the San Juan region. Mogollon traits certainly reached the Chaco area to the north, for in this section several Mogollonlike pottery types are known. It is the further feeling of the writer that this culture carried many traits to these people which are now ascribed to Hohokam influence. Mogollon traits also went west through the Puerco and Little Colorado Rivers to about Flagstaff. As a



A view from Sunset Crater looking west to the San Francisco Mountains. It was such cinder-covered volcanic country into which a large population moved from all directions soon after the eruption of Sunset Crater and the partial stabilization of the cinders which this eruption scattered about the country.

result of the sudden blending of these many influences, radical changes and rapid cultural rises in local areas were effected. The center and greatest development lay to the east, probably in Chaco Canyon. Many traits emanated from there to other regions, although in such places as the vicinity of Flagstaff some culture traits remained relatively primitive.

The speed of evolution of Pueblo architecture is still amazing. Although all necessary architectural features were known by people with Basket Maker and Pueblo I types of culture, a full-blown architecture appeared very suddenly at about A.D. 900. With sufficiently detailed

study, particularly in the four corners region, this evolution will probably become much more understandable.

In general the culture which flourished in the plateau was widespread. It also appears to have had much influence on that of other areas. Trade was widely established, and contacts must have extended through south and central Utah to southern Nevada and on into California, as well as into southern Arizona and southern New Mexico. From such information it is possible to state that this was certainly a period of dissemination, but it was also a period of very rapid blossoming of Pueblo Culture. Even in the backward Flagstaff area the way was paved for a striking development during the next period.

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Chapter XIX

CLASSIC PERIOD A.D. 1100-1300

PUEBLO III CULTURE STAGE

Of all archaeological periods in the Southwest the most definite information has been obtained concerning the culture which flourished in the plateau area during the Classic Period. This specific knowledge includes a wide geographical range and the entire time span represented. Large sites were flourishing throughout much of the plateau, and are therefore impressive and easily located. They contained quantities of "loot," to reward the efforts of the archaeologist quickly. Douglass was also able, early in his work on tree rings, to establish dates for most of these sites, and thus directed a good deal of popular interest to them. Subsequently almost all other sites of similar age which have been dug were dated, so that it is undoubtedly the most accurately dated of all Southwestern periods.

As a result it is possible to speak of a late and an early phase of the culture of this time, in most sections. The early phase existed from A.D. 1100 or 1130 to about 1200 and is the less understood of the two, although there is a good deal of specific information concerning it. The late phase existed from 1200 to 1300, in most sections, and is widely and fairly well understood.

Dating of the beginning of this period has been firmly established in the western portion of the area by the abandonment of the Deadmans Black-on-white type of pottery and the introduction of polychrome types. In other sections the beginning date may be determined by similar ceramic changes, one of which is the deterioration and decrease in abundance of corrugated types. The end of the period is marked by the Great Drought, which has been established by Douglass and repeatedly referred to by others.

This period, from A.D. 1276 to 1298, saw practically no rainfall over the greater portion of the Southwest; in fact the drought was so severe that it left a marked record in the ring growth of trees in practically all

sections. That it was extremely disastrous to the aboriginal population, particularly of the plateau area, is proved by the abandonment of the entire San Juan. A shift of population is found to have taken place about A.D. 1300 to the south and east, a direction in which Pueblo contacts had already been established. Movements were to areas where a sufficient water supply was assured in dry time. Such locations were the southern end of the Black Mesa, now occupied by the Hopi Indians, the mountain section of the state, the Zuñi area, and a large portion of the immediate Rio Grande Valley.

From the accompanying map it is apparent that the area of greatest concentration and purest culture had been reduced. Fewer sites were occupied, but they were much larger on the whole than those of the previous period. One point must be kept in mind when examining this map; the occupation of the Rio Grande is not included. It would thus be possible to extend the area much farther east, as has been indicated by the outline of maximum diffusion. There was also a southward extension of Pueblo Culture,

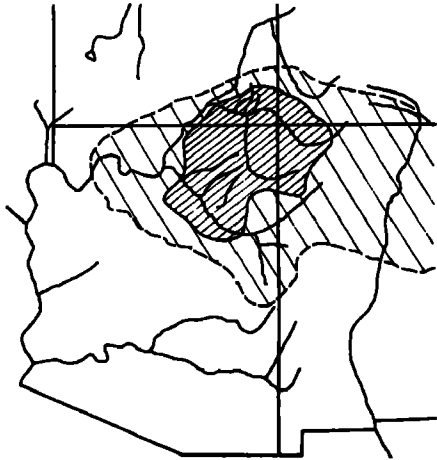


FIG. 121. Map indicating the extent of culture during the Classic Period. No attempt has been made to include Rio Grande or Salado Cultures in this map. Both the area of greatest concentration and that of maximum expansion are reduced, being withdrawn particularly from the north and west, and expanding to the south and east. Fewer but larger sites were characteristic at this time.

which, although it became modified almost immediately, penetrated well into the Upper Gila drainage area. As it has been designated the Salado Culture, it will be discussed more fully in another chapter.

Probably most striking is the decrease in the area of maximum expansion. The direction of movement seems to have shifted slightly, with more emphasis on expansion to the east and south than to the north and west. Extension of influence and trade also seems to have been greatly reduced to the north and west, and to have shown a considerable spurt to the south and to a lesser extent to the east. The purest Pueblo Culture is certainly to be found now lingering only in the immediate San Juan

area, as Mogollon Culture had already established a strong influence in the eastern portion, and Hohokam Culture a similar influence in the south and west.

One of the most interesting problems of this period is the explanation of the increase in size and decrease in number of the sites. Several suggestions have been made in an effort to account for this fact. One has already been discussed by the writer, namely, that the natural cultural evolution of the people would result in the compaction of the popula-



This circular kiva found at Cliff Palace is a typical Mesa Verde kiva. Characteristic features are the small size, banquette, pilasters, bench, ventilator, deflector, and firepit.

tion. A second suggestion has often been made, that the press of enemies required the building of large pueblos for protection. As far as the writer has ever been able to see there is no real evidence of warring in the plateau at this time. Compared to the many skeletons found with arrow heads still embedded in the bones in the Mississippi valley, skeletons from the Southwest with such evidences of warfare are extremely rare. Most pueblos are also found upon careful examination to be anything but deliberately formed forts. Actually they are probably mostly

an outgrowth of a realization that by grouping rooms the number of walls required is greatly reduced. This is well illustrated by the utilization of large blocks of rocks and the curving back walls of caves for the same purpose. From all present definite information it would appear that the Navahos existed as a threat to the Pueblo people only at a much later date. There is some indication that certain intervillage "squabbling" did take place, however, for some few sites are found which were definitely fortified. These almost invariably are the outposts lying at the edges of culture areas, and very likely they represent contacts between two more or less unfriendly ethnic groups. In other instances local failures of crops probably resulted in raids on neighboring groups, which have left indications of sporadic fighting. Such evidences do not appear to be universal even in any one small section.

From the essential bibliography included at the end of this chapter it may be seen that there is considerable literature dealing with the culture of this period. Most of these reports are an exposition of the regional variations from the general Pueblo Culture pattern which existed. For this reason no serious attempt will be made to present a detailed discussion of each variation. As there was actually a great deal of overlapping or blurring of local cultures an almost infinite number of regional variations might be pointed out. Since such microscopic division is impracticable, small sections will be lumped and only the most outstanding characters of the major divisions discussed. To the writer four such major divisions are apparent. These are: (1) that area lying between Flagstaff and the western San Juan; (2) the Hopi country, including the Hopi washes, the Little Colorado River throughout its central section, and the Puerco drainage; (3) the Mesa Verde section of the eastern San Juan; (4) the Zuñi area of the Upper Little Colorado River in the White Mountains and eastward into the Zuñi River region near the state line.

As pottery and house types give the most definite information concerning regional variations of culture, the characteristic features of these two traits will be discussed first by the sections outlined. After this a general discussion of the other material culture traits will be presented.

Sometime near A.D. 1100 Moenkopi Corrugated pottery began to develop from Tusayan Corrugated. In all features of paste, temper, and finish the two types are exactly alike; they differ only in the manner of production of the corrugations. Moenkopi corrugations are less well marked in all features than Tusayan. The coils are wider and flatter,

the indentations farther apart, less deep, and irregularly spaced. In some instances they are so poorly formed that a second glance is required to realize that the surface is indented corrugated. Vessel shapes are similar to Tusayan, with the possible exception that they are more inclined to be squat and globular, particularly the pitchers. The evolution from one type to another was not sudden, so that many intermediate forms

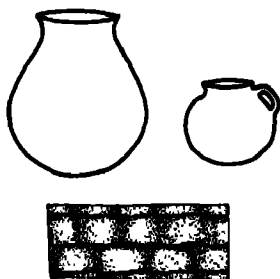


FIG. 122. Outline of most common vessel shapes and detail of Moenkopi Corrugated pottery type. This type serves as an indicator of this period.

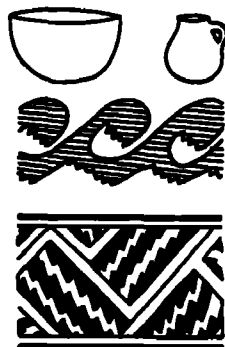
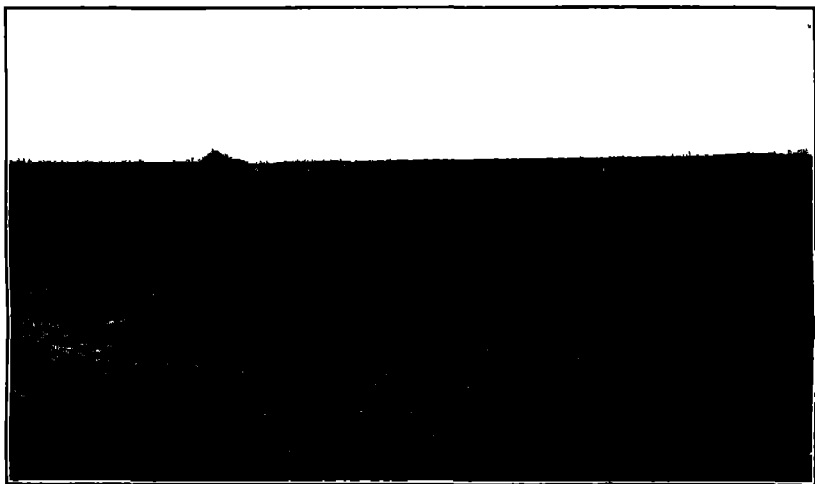


FIG. 123. Vessel forms and style of design of Tusayan Black-on-white pottery. This type is indicative of the early portion of this period from A.D. 1100 to 1200. This style of design is found on several pottery types.

are found. The general impression is inevitable that care was not exercised in the manufacture of such vessels. More carefully corrugated types were in vogue to the southeast, but these were oxidized and red or brown instead of the gray of the Pueblo types. Moenkopi Corrugated was widespread, and in most instances is a good indicator of this period, for it lasted to about A.D. 1300.

The first definite area to be discussed is that which seems to have centered somewhere in the Moenkopi Wash. Influences were extended both north to the western San Juan and south to the Flagstaff area. As a great many pottery types have been identified from this section it is more profitable to speak of styles of design in the black-on-white types than to refer to them specifically. The Tusayan style of design is diagnostic of the early portion of this period here. It is typically composed of rectangular blocks forming the pattern, which are made up of zigzag lines and opposed triangles as illustrated in the lower portion of Fig.



Wupatki Pueblo near the Little Colorado River northwest of Flagstaff is made of flat sandstone blocks, for this material is easily available here. The site is built over and around two clusters of large rocks and is in two sections.

123. In some pieces the central line is omitted and the opposed triangles are exaggerated. Large hatched scrolls, as shown in the same illustration, are also found to be typical, particularly on large vessels such as storage jars. The forms are predominantly bowls and jars as shown, but large jars with small mouths also occur. The temper is sand, the paste gray with a white slip and a clear carbon black paint forming the design. A feature which appears to be characteristic of some of the many types with this design is an outflaring rim with a marked angular interior shoulder. This style seems to have existed most abundantly from about A.D. 1100 to sometime after 1200.

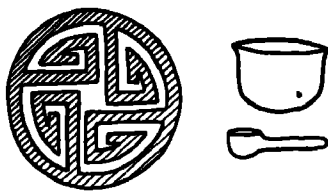


FIG. 124. Forms and simple style of design found on Tusayan Polychrome. This is the earliest polychrome type which became popular in the plateau area. The background is orange, the hatched portion red, and the black line black. In associated types it existed from about A.D. 1100 to 1300.

At about the same time Tusayan Polychrome was evolved as the first polychrome pottery to achieve popularity in this section of the plateau. This type was a direct development from Tusayan Black-on-red, through Citadel Polychrome. The paste,

finish, paint, and even some of the designs are similar to the former type, with the exception of the red slip which was applied only as a form of wide-line design outlined with black. This left the orange paste without a slip forming the background of the red and black design. The temper is prepared soft angular material, and the surface carefully smoothed. The forms are bowls, ladles, and perhaps jars. The bowls have straight sides, often with slightly flaring rims, and small strap handles placed just below the rim and parallel to it. The interior is decorated with red lines outlined with black on an orange background, the exterior with broad bands or wide lines of red on the unslipped orange surface. This type of pottery began about A.D. 1100 and lasted to about 1300.

In the latter portion of the period a very striking black-on-white pottery developed. The finest type which has this style of decoration is Kayenta Black-on-white. The paste is gray to white and contains fine sand temper, so fine in fact as to be almost invisible to the naked eye. The surface is slipped white and has a clear carbon black paint. True

Kayenta Black-on-white is well fired and gives off almost a metallic ring when struck. The style of decoration is very striking and was widely copied in other types.

It is so applied as to appear a black background with white lines forming the design. This style has been variously termed "negative," "mosquito bar," and "massed black." See Fig. 125. Forms are bowls with straight sides and horizontal strap handles, ladles of the bowl and handle variety, and a distinctive

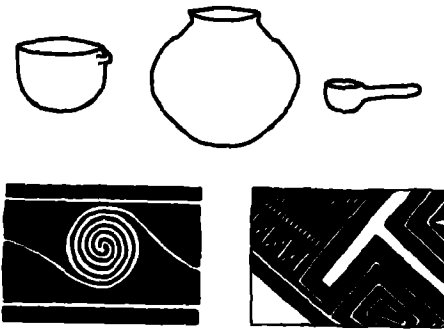


FIG. 125. Vessel forms and style of design found on Kayenta Black-on-white pottery. This style of design is indicative of the latter portion of this period, or from about A.D. 1200 to 1300. Poorer copies of the negative motif were made on other types.

large jar. This has a flattened area below the neck and a tendency to a rounded "gila shoulder" lower on the body. It is one of the most striking types of jars produced in the Southwest in any period. Although less formalized styles of this type of decoration were being produced by about A.D. 1200 the most highly developed forms do not seem to have appeared until almost 1275.

At about 1275 another type was produced in the Tsegi or northern portion of this area. It is Kayenta Polychrome, and is exactly like Tusayan Polychrome except that the black line is in turn outlined with a fine white line. Forms are bowls, as described for Tusayan Polychrome, ladles of the bowl and handle variety, and small jars or pitchers.



A general view of the north end of Kiet Siet Pueblo. A circular kiva is in the foreground. Rectangular rooms with roof support poles extending beyond the wall are typical. Doorways with recesses for the reception of flat slab covers show in the upper left.

Moenkopi Corrugated is found associated with all these types and so is probably one of the best time indicators of this period in the western area. In the very earliest portion Tusayan Corrugated occurs in small amounts, and Tusayan Black-on-red in slightly greater numbers. Because of this overlapping of types it is necessary to consider ceramic complexes in dating individual sites in which beams are not secured.

House types in the early portion of the period to the north appear to have been relatively small masonry pueblos with a circular or rectangular ceremonial chamber. Sites of this age have not been carefully investigated, for they are far overshadowed by larger later structures. In the

Moenkopi and Flagstaff areas the pueblos are also of masonry and as a rule of moderate size. All the kivas are rectangular and more or less underground. Wupatki Pueblo is a fine type site of this section and time.

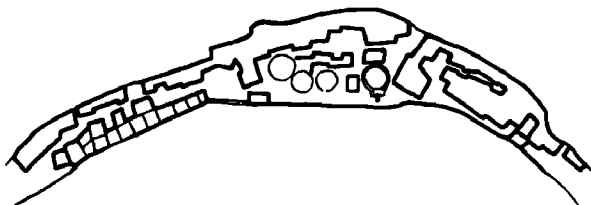
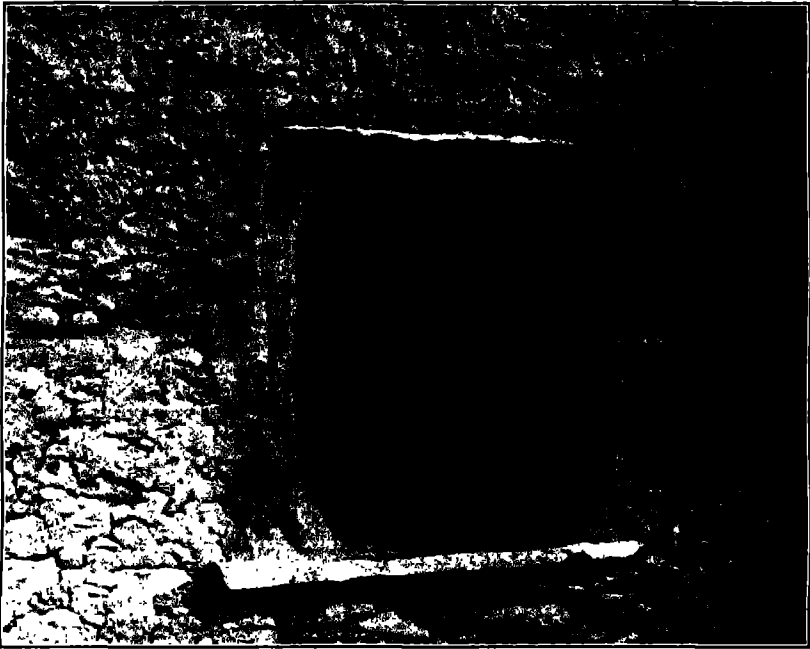


FIG. 126. Rough sketch plan of the house blocks of Kiet Siel Pueblo. It is the largest cliff pueblo in this section. Relative room sizes are indicated to the lower left. Circular kivas with bench and platform are found here. The masonry is much cruder than that to the east.

It is a medium-sized pueblo, with two units of closely massed rooms above ground and several rectangular only slightly sunken kivas. The masonry is of sandstone blocks, chosen for form but not carefully shaped to fit, and set into a mass of mortar from both sides of the wall. The core of such masonry is filled with a quantity of clay and small stones.

Late sites to the north have both circular and rectangular kivas. At Kiet Siel circular kivas occur, while at Betatakin, about eight or nine miles away, only surface rooms which might have served as kivas are found. Other interesting architectural features in these sites are wattle and daub walls, walls made of turtle backs, small doorways closed with an inset stone slab, and loom ties in rooms. To the south in the Flagstaff area, only rectangular underground kivas are found. These are masonry lined and have a ventilator leading out one of the long sides, but no other kiva features. A typical site in this southern portion is Turkey Hill Pueblo; to the north, Kiet Siel and Betatakin, both in the Tsegi system, could serve as types.

In the second area, that of the Puerco, Little Colorado, Hopi country, three new pottery types are found. Tularosa Black-on-white is the first and most interesting. The dates, although not so accurately established, are from 1100 to 1200. For the present no attempt at division of this type will be made, although Gladwin has pointed out that three regional distinctions may be seen, the Puerco, Roosevelt, and true Tularosa Black-on-white types. These three types will be combined under one general descriptive term and called Tularosa, for this name is best



A doorway in one of the rooms in Kiet Siel. A flat slab was fitted into the recessed shoulder to close the room.

established in the literature. The importance of this broad group lies in the fact that it is a part of the Salado Culture, which by now had begun to penetrate the mountain section south of the plateau. Originating in the Little Colorado it reached the Upper Gila area, and spread throughout most of the headwaters of the Gila and Salt streams. The paste is gray to white, with crushed or prepared angular temper fragments. The surface is covered with a white slip and decorated with a black iron carbon paint which may locally burn brown or red. It was made by the coiling and scraping process, and was fired in a reducing atmosphere although some examples are found which have been in part oxidized, apparently almost always by an accidental secondary firing.

Both designs and forms are very characteristic features of this type. Designs are either purely rectilinear or a combination of rectilinear and curvilinear elements. There is a tendency for solid and hatched areas to be balanced, as in the design illustrations in the accompanying figure. Fine hatching was widely used, in which the hatch lines are drawn

parallel to the long axis of the area to be filled in. Once the design elements and combinations are thoroughly in mind this general pattern may be very easily recognized wherever it is found. Since it is most striking its probable derivation is of some interest. The abundance of fine hatching points first to the Chaco Canyon as a basic source of at least part of the design. Next would be features derived from the Mesa Verde, such as the opposed stepped triangles.



FIG. 127. Forms and styles of decoration of Tularosa Black-on-white pottery. Designs consist of balanced solid and hatched elements, and long fine parallel lines in hatching. Forms are very typical. The bowl has sloping sides. Pitchers are globular, often with animal figurine handles, some of full figures, others with only protruding heads.

west, where rectangles and triangles are most prevalent. From this it is apparent that the pattern was derived from a combination of elements and ideas secured from several sources. These styles and elements of design were carried into later types and further elaborated.

Forms are bowls with distinctly sloping sides, suggestive of Chaco Canyon ladles of the bowl and handle variety, and pitchers with animal figurine handles. The bodies of pitchers tend to be squat and very rounded, with relatively constricted necks. Effigy handles are either simply heads of animals, as in the lower left-

hand example in Fig. 127, or of full animals spanning from the neck to the body, as in the lower right-hand figure. So far as the writer is aware such handles are confined solely to this pottery type.

Farther west, in the central Hopi country, Jeddito Black-on-orange made its appearance. This type dates later, A.D. 1200 to 1300, and is in fact a good diagnostic of the latter half of the Classic Period in this section. It is the first of a long series of Hopi orange or yellow types, and marks a definite shift in interest from pottery largely produced in a reducing atmosphere to that fired in an oxidizing one. Temper consists of angular prepared fragments and a slight amount of sand. Paste is light

brick red to orange, and there is no slip. The pigment of the design is manganese; apparently it was often applied lightly, and it fires black varying to a reddish brown. Forms are bowls, ladles, and rarely jars. The designs are found on the inside of bowls and ladles and the outside of jars; they consist of hatched and solid elements. A characteristic

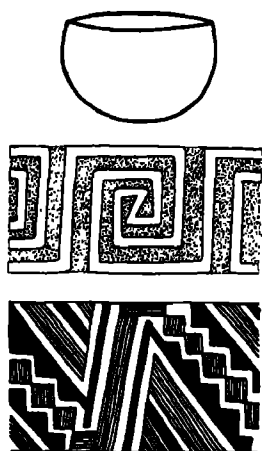


FIG. 128. Form and style of designs of St. Johns Polychrome. The lower design, black on the orange-red base, is found on the inside of the bowl. The upper design is a white band on the outside below the rim, the shaded area of which represents the orange slip. The hemispherical bowl shape is typical. This type was very popular and most widely traded.

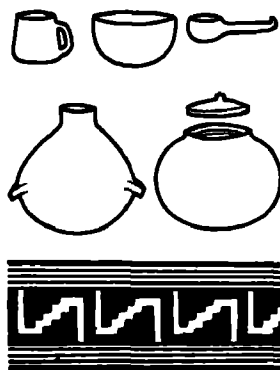


FIG. 129. Mesa Verde Black-on-white forms and designs. The stepped element and framing lines are typical. Forms such as the kiva jar in the lower right are very outstanding. The down-raking handles on the jar, the mug, and the upturned tip to the ladle are all equally characteristic.

feature is the presence of a broad "life line" just below the rim on bowls. A similarity both in form and in design to the next type to be described indicates some connection between the two.

To the south and east St. Johns Polychrome had developed by some time between A.D. 1100 and 1200 to a very important position. The paste varies from gray to brown and contains angular prepared fragments of temper. Vessels were produced by coiling and scraping and were slipped with a heavy bright red-orange slip. The only form known is hemispherical bowls, which are so named because the greatest diameter is found below the rim. Rims are invariably beveled inward. Black de-

signs, both geometric and curvilinear, occur only on the interior. Many of them are so very suggestive of the Tularosa style of design that they may be definitely ascribed to the same source. On the outer surface a zone below the rim is decorated with a wide rectilinear band or by repeated small geometric elements in white paint. Thus three colors, orange, black, and white, are present, and the pottery is classed as poly-



Sun Temple in the Mesa Verde is a fine example of the superior masonry found in this section. Circular towers are characteristic of this culture. This building is located on the top of the mesa above the cliff dwellings.

chrome. This is one of the most pleasing types of pottery ever produced in the plateau area. Not only may it be appreciated today but it was equally appreciated then, for it was one of the most widely traded types ever produced. Wherever sites of any size or duration are found which date between about A.D. 1100 and 1200, fragments of St. Johns Polychrome are almost certain to occur. Such evidences of trade have been traced as far south as Mexico, both in the Rio Grande and the Gila and Salt drainages, and they have been found in all sites throughout the plateau area.

House types in this section appear to be relatively small pueblos of surface, masonry, rectangular rooms. Throughout the Hopi country present fragmentary evidence indicates the presence of sunken, masonry, D-shaped kivas.

Turning next to the four corners the Mesa Verde Culture may be seen to have succeeded in overshadowing Chaco Canyon Culture by this time. The most outstanding pottery type is Mesa Verde Black-on-white. The paste is gray to white and contains angular fragments of temper. The slip is a distinctive pearly gray-white, with a depth of luster which often gives one the feeling of being able to peer slightly into it. The paint is carbon black; the design characteristically occurs in bands or zones with parallel framing lines above and below, and the geometric elements are often so arranged as to give a slight suggestion of the Kayenta negative style of execution. Opposed stepped triangles, as illustrated in Fig. 129, are a very common element. Bowls uniformly have square rims, as is often true of other forms, and are decorated with large dots or dashes or both. Forms of this type are very characteristic and distinctive. The kiva jar is round bodied and has the only true pottery lid ever produced in the Southwest. Had vessels of this sort been made with spouts and a handle they would have looked very much like teapots. Relatively large jars were produced, with down-raking handles located below the center of the body. They are globular in form and have small necks. Mugs, strongly suggesting beer mugs, with vertical handles are also very characteristic. Bowls have straight sides and square rims, and ladles are of the bowl and handle variety but with the tip of the handle most commonly turned up.

In the Chinlee and Chaco Canyon areas Mesa Verde styles of decoration and forms appear to have been combined with the preceding Chaco Canyon types to produce a hybrid characteristic of neither. In the Puerco area it has already been suggested that Tularosa Black-on-white was such a cross. From these ceramic indications, and other characters such as masonry types, it is possible to determine that Mesa Verde people actually moved south at this time to occupy many of the larger sites in Chaco Canyon and bordering areas. Thus the cultural leadership of the plateau area changed now from Chaco to Mesa Verde people. Marked influence also spread east into the Rio Grande drainage area, there to build upon Chaco characters.

In this discussion of pottery only the most diagnostic styles of design and the most outstanding types have been mentioned. However, it must

be recalled that a great many specific pottery types were being produced. Not only was regional variation at its maximum throughout the plateau, but also Pueblo Culture was spreading from the plateau into many other areas. Salado Culture had gotten well under way, and a strong influence was being exerted on the Rio Grande valley. Certain basic concepts and influences even appear to have spread slightly to the west and north.

The finest stone masonry in the Southwest was produced in the Mesa Verde at this time. Individual blocks were carefully shaped and laid with very little mortar, and at most only slight chinking. To square ends and flatten surfaces the blocks were shaped by pecking, so that the surface of the stone is often distinctively dimpled. So far as the writer is

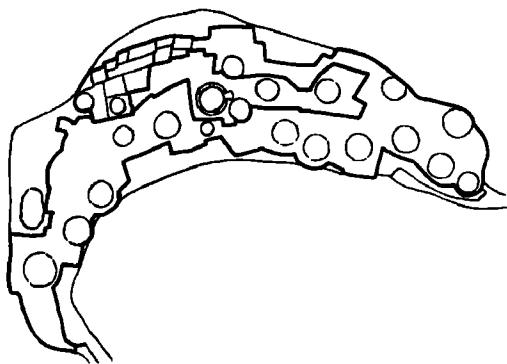


FIG. 190. Rough outline plan of Cliff Palace. The heavy lines outline blocks of rooms, which are shown in comparative size in the upper left portion. Kiva positions are indicated by lightly sketched circles, only one of which has been completed. Irregularly shaped rooms are characteristic.

able to learn this is also the only area where solid rock walls were produced. By this is meant that individual stones often extended from one surface to another, so that no core of rubble or clay was used. As a result the walls were usually thin, and most of the rooms were relatively small and irregular in shape. This is particularly characteristic of the large pueblos located in the caves of the Mesa Verde area

proper. Kidder has pointed out that they give the appearance of having started in a modest way and then added to as necessity demanded.

Probably one of the most typical features of these sites is the presence in every pueblo of one or more round, oval, D-shaped, or rectangular tower. These are usually called watch towers as they are located in such a way as to command the approaches to the pueblo, and are often loop-holed. Kivas are abundant and very characteristic. They are as round as it was possible to build them and average about thirteen feet in diameter. They are always underground or, where close bedrock was encountered, excavated as far as possible, a retaining wall being built around

them and the intervening space filled with earth. A narrow bench with six masonry pilasters encircles the room, thus forming six equal-length segments the southernmost of which is widened to form a platform. A ventilator leads under this southern recess to the floor. Beyond it is a masonry or wattlework screen or deflector, beyond this a firepit, and still farther in a straight line a "sipapu" three or four inches in diameter. This type appears to have been strictly adhered to.

By far the best-known sites in this section are those of the latter portion of the period, as represented by the several large cliff dwellings included in Mesa Verde Park. Of these, Cliff Palace is the largest and probably the best known. Lowry Pueblo, in southwestern Colorado, is an example of an earlier site which shows a mixture of Mesa Verde and Chaco Cultures. Aztec ruin and several of the large sites in the Chaco Canyon show similar mixtures of culture, or replacement by Mesa Verde occupants, most of them dating well before the end of the period.

In the fourth area to be considered, that which has been designated Zuñi, one very distinctive pottery type, Pinedale Polychrome, developed late in the period. The dates suggested in the chapter on pottery are from about A.D. 1250 to 1325. The paste is gray and the temper is normally ground-up potsherds. It is covered by a heavy red to orange-red slip which has been well smoothed. Designs are in either a thin dull black paint or the earliest true glaze paints to be used in the Southwest. The glaze paints are often so thick as to be slightly raised above the surface of the vessel. Designs, both purely geometric and conventionalized, show a definite outgrowth from Tularosa and St. Johns Polychrome types. Vessel forms are hemispherical bowls and much more rarely jars. The interior of bowls has a black design on the red-orange slip, while the exterior bears a black design outlined with a thin chalky-white line.

This type is the first of a series of specialized types developed in this area which made a considerable use of glaze paints. They were still further evolved during the next period in the true Zuñi area, farther east. Its derivation may be traced by design elements and color combinations back through St. Johns Polychrome, from which the color ideas were certainly derived, to Tularosa Black-on-white, from which many of the elements came. Thus it must be included in any discussion of the Salado Culture, which was by now working southward through the mountain section.

Unfortunately, architectural types are incompletely known for this

time. Small masonry surface pueblos seem to be characteristic in which both sandstone blocks and many spalls were used. Judging from later kivas such structures were rectangular and shallow and contained a raised platform at one end or side strongly suggesting the present-day type of Hopi Kiva.

The variations found in masonry in these several regions have been



FIG. 131. Comparison of masonry types from the Mesa Verde (upper) and Western San Juan (lower) areas. Mesa Verde blocks are shaped and have little clay mortar and few spalls. The western San Juan type is of very irregular blocks with much clay mortar and many spalls.

pointed out, and now it might be well briefly to summarize the types represented. Masonry of the western San Juan is relatively poor. See Fig. 131, lower figure. Here thin slabs of odd-shaped sandstone were laid in abundant clay mortar, acting as much as a binder to hold the wall together as for the main support of the wall. The best masonry type is in the Mesa Verde section of the eastern San Juan, where true masonry was built; blocks are carefully shaped often by pecking and laid in very little mortar. An intermediate type is found throughout most of the Hopi country and Upper Little Colorado area, although it is inclined to be largely of the western San Juan type. In the mountain

areas, including that section around Flagstaff, still cruder masonry walls were made of boulders.

Physically the Pueblo people of this period are much the same as those of the preceding period. The skull is broad or round, and deformed posteriorly, often to one side. The frame is light. As has been pointed out, skull deformation was probably accomplished not primarily by the use of a hard cradle board, but by a hard head rest upon which the head of the infant was placed. As a result cradles may now be disposed of by simply stating that they also are similar to the types described.

It has been the common assumption of most of the excavators in large sites that they have not located the main burial plots of the inhabitants, for they have felt that more should have been recovered than are usually found. Perhaps the people buried in widely scattered individual spots, like the Navahos today, so that no definite burial ground

was used. However, it is quite likely that a fair percentage of burials have been found, and that the excavators have been inclined to assume a larger population than actually existed. Burials have been located in trash heaps, under the floors of rooms, and in sealed and abandoned rooms. In fact inhumation was practiced in almost any spot where digging was relatively easy. The bodies are generally flexed in the western



Cliff dwelling in lower Oak Creek south of Flagstaff. It is of a Pueblo III stage of culture and was built of sandstone blocks which are readily available in this section of the mountain area.

San Juan; in the eastern either flexed or straight. To the southwest many are straight in that area in which Hohokam influence appears to have penetrated.

Cremation is occasionally found in widely scattered sites. It was practiced in the Flagstaff area in certain cultures flourishing at this time, and it occurred as far north as the western San Juan. Fewkes reports evidences of cremation in the Mesa Verde section, and it probably also was occasionally practiced to the southeast. As this is a basic culture trait,

one associated with religious ideas and teachings, it is felt to be a strong indication of actual culture contact, perhaps even of movements of people. It is a satisfying fact that it is found only in such sections and at such times in the plateau as would suggest some remote Hohokam characters. As cremation was a universal Hohokam habit it may be taken as basically of this origin, although it must be admitted that under unusual circumstances an individual in any culture might have been cremated.

Both metates and manos show considerable variation. During the earlier portion of this period in certain sections, particularly to the southwest, high-sided metates open at both ends seem to have been in general use. To the east, and in the San Juan drainage, scoop-shaped shallow metates open at only one end were more common. Later these were widely replaced by a flat sandstone slab set into a box. This type was a permanent fixture of the dwelling, as the upright box slabs were set into the floor and the metate stone set into the box in a bed of mortar. Manos varied from the plain block type to grooved or triangular forms. The triangular form was evolved by wear from the block type.

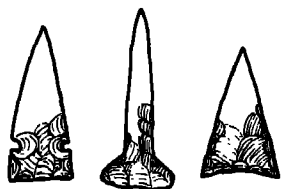


FIG. 132. Arrow points are still predominantly triangular in this area, both with and without side notches. The winged drill point shown in the center is also typical.

Axes are predominantly of the three-quarter-grooved type, the only full-grooved forms occurring in the San Juan area. Although they are not so long and slender as the finest examples from the Gila, they are very well made. Both from the distribution and from the materials of which these axes are made it is quite likely that they were traded into the plateau from the south, and not made locally. Full-grooved mauls are still quite common. Other ground stone implements show considerable variation, both in form and use, suggesting rasps, saws, and

an abundance of various abraders. Polished stone mirrors were also still being made, at least in the western San Juan area, in both rectangular and circular forms.

Arrow points, as a rule, are not found abundantly in any sites of this period, at least as judged by midwestern or other standards. Certainly such hunting implements did not assume the importance that might be expected of them. Although the actual point type appears from the scanty published descriptions to be varied between regions, the pre-

dominating form is still essentially triangular. Lateral notched types are widely distributed, and triangular points without notches, as illustrated in the accompanying diagram, are not uncommon in the Tsegi area. Winged drills, as illustrated, are also relatively common. They are square or triangular in cross section and obviously were held in the hand for boring. A close similarity to midwestern types is suggested. Knife points are common, are usually more coarsely chipped than arrow points, and are often found set into wooden or bone handles. They are not as a rule large blades, and many might possibly be considered arrow points of unusual size. Where obsidian was available this material was used for points, chert being more commonly utilized in the manufacture of knives. Large sharp fragments of chert and obsidian were also used as cutting tools, judging from the abundance of such implements found in every site.

Apparently without exception wherever sites of this age are seriously excavated evidences of yucca ring baskets are found. From this it may be considered the most characteristic basket of this time. Coiled baskets, although possibly not so abundant as in earlier sites, are represented. They are of the usual two-rod-and-bundle variety in most sections, although at Pueblo Bonito three-rod baskets have been reported, and Judd mentions a one-rod basket from his work north of the Colorado River. The shapes seem to have been about as reported from previous times. Rush matting was probably very common and is often found covering the floors of excavated rooms. It was made in quite large mats and had a definite selvage or edge.

Sandals are well known and are, at least in some types, very characteristic. The most typical is that with a notched toe, as shown to the left in the accompanying illustration. The most striking feature of the sandals is that they are predominantly of the twilled weave, of split or unsplit yucca leaves. As twilled weaving in yucca and reeds was very common at about this time it may be assumed that this style of mat and sandal making had become popular in preference to the twined weaves of the Basket Maker stages. The notch for the toe is on the outside of the foot, in the area of the small toe, definite rights and lefts being made. Other sandals of the same weave have more rounded or somewhat pointed toes, and squared toes. The ends of the leaves, often shredded, were left on the underside of the sandal to give it a thick sole and to act as padding. Only fine weaves have been illustrated, although a great many coarse examples have been found. Some twined woven sandals in

very coarse weaves were also made. The notch-toe sandals from Pueblo Bonito are of particular interest in establishing a date and region for their origin. If they belong to the Chaco period of occupation of this site they are the earliest sandals of this type known in the plateau, but if they belong to the Mesa Verde occupation they would fall in the period here discussed.

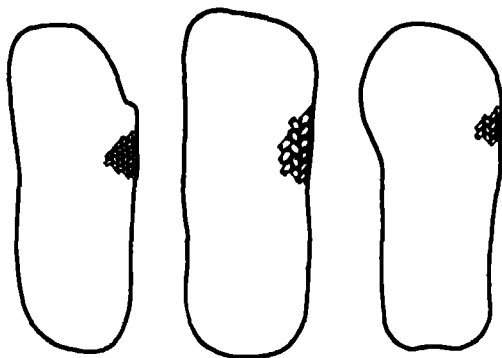


FIG. 133. The most common type of sandal is now made of split or whole yucca leaves in a twilled weave. The notched-toe form on the left is the most characteristic and diagnostic of this period. Other forms tend to be either round or square toed.

Cloth fabrics seem to have reached a very high development and although they maintained about the same status during the next two periods even the finest appear, if anything, to have been only slightly better. Fur blankets assumed an important status in the clothing of these people, as might well be expected for they are still made by Hopi Indians. However, the most striking fabric development was the rise in abundance and varieties of forms and weaves of cotton cloth. The presence of large cotton blankets, some of several feet, required the use of a large loom, almost certainly a complex upright loom comparable to that of the Hopi or Navaho Indians today. Only narrow strips of fabric could have been produced on the horizontal or slanted belt loom, and to make larger pieces it was necessary to sew several of these strips together. Because the large fabrics were made in one piece it is assumed that the vertical loom was known and in use.

As has been suggested, variations in both form and weave are exceptional. Some of the most interesting fabrics were produced in the coil without foundation weave from yarn made of cotton fibers. They were

made into shawls, caps, and leggings which were worn above sandals or more rarely attached to them. One very exceptional shirt found at Poncho House was made of four pieces sewed together to form the front, back, and sleeves, with a slit for the head. As this poncho is like the Mexican and Middle American type in use today it may possibly show contacts in this direction. Yarns were colored red, brown, black, and white, and were woven in all important weaves known by later weavers in this area, including the straight over and under and the twilled. A loose warm cloth was made with a slightly twisted filler or weft, and a heavier canvaslike cloth of a tightly twisted weft and warp. Sometimes

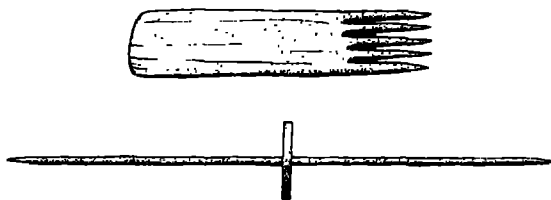


FIG. 134. The upper object is a wooden comb probably used in packing down the filler or weft threads in weaving cloth. The lower is a spindle complete with whorl which was used in spinning or twisting the fibers to make yarn or thread for weaving.

the heavier cloth was painted with a pigment in designs after it had been woven. Tye dying was also known at this time, as one fragment of green dyed cloth from the Tsegi country shows. This had a green-blue background with parallel rows of white dots with green centers.

Rawhide and dressed buckskin were manufactured into a number of articles of clothing and dress. They included relatively large robes and moccasins. Nowhere, however, were they very abundant.

Hunting implements were little different from those already described as typical of the earlier periods. The bow and arrow was certainly still the main hunting weapon, and the use of the rabbit stick became much more common. Snares and nets were also abundant and in general use for the capture of both animals and birds. The presence of large rabbit nets made of yucca fiber cord in a true netting weave, and suggesting very long tennis nets, is probably a survival from Basket Maker Culture.

Ornaments had become generally diversified and abundant. A considerable use was made of turquoise, particularly in the east. Inlays appear to have been quite common, and beads of all sizes from one-half

inch in diameter to microscopic were made of jet, hematite, lignite, turquoise, shell, stone, and clay in abundance. Turquoise was generally used for beads, pendants, and inlays. Shell was most commonly used as pendants, rings, and bracelets. Stone was used for beads, pendants, and occasional rings. None of these objects were so elaborately carved or so well made as those from the Hohokam Culture. Olivella shell beads were still very popular, for they could simply be cut or ground off at the end and strung. Abalone shell was also used rarely for pendants because of its unusual color. The black buttons, either in squares or circular disks, which were highly polished and average about two and a half inches in diameter, were common throughout the San Juan area. These have already been compared to the pyrite mirrors of the Hohokam.

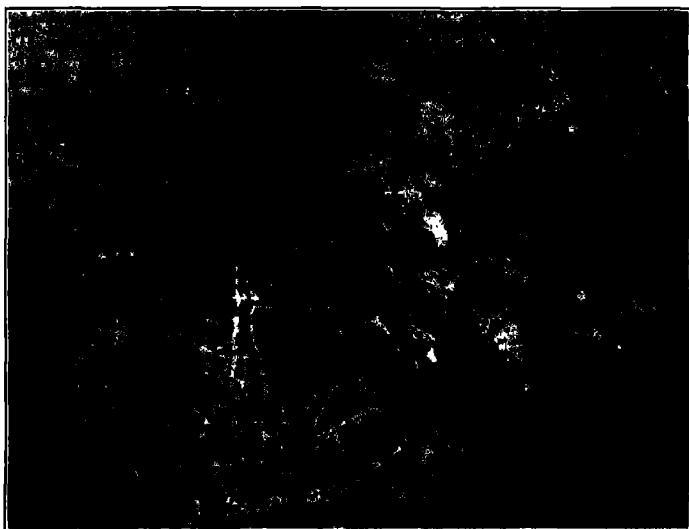
Pipes were widespread although not anywhere very abundant. The most common form was the straight or tubular pipe of stone or clay, as already described. Elbow pipes were rarer, although they did occur; they are somewhat suggestive of the elbow pipes of the plains and mounds regions to the east. Stone pipes were carefully made, well polished, and seldom decorated.

Probably a greater variety of ceremonial objects is found now than from any preceding period in the plateau. The most common is a small leather or cloth bag which contains a collection of pebbles and other queerly formed objects. This is probably a medicine bag. Besides such trinkets there is a great variety of wooden objects, such as crooked and painted sticks, bundles of intertwined twigs in the form of complex crosses, and human and bird effigies. Odd-shaped stones were also occasionally painted. Strikingly enough, the most varied collection of such objects has come from the western San Juan region.

In summarizing the Classic Period probably the most outstanding characteristic could be stated as a general high level of all traits. This balance of its various components is one of the features which marks a rather highly developed culture. Variations in ceramic and house types have been pointed out for four regions of the plateau. These are the western area from about Flagstaff north to the western San Juan; the Hopi country including the Puerco, Little Colorado, and Hopi washes; the eastern San Juan area comprising the Mesa Verde-Chaco sections; and the Zuñi area in the upper waters of the Little Colorado River and including the Zuñi River.

The introduction of polychrome pottery is a feature of this period, for three important types of polychrome appeared. To the west Tusayan

and Kayenta Polychrome developed. In the central section St. Johns Polychrome had an early rise to enjoy great popularity. From this and to the southeast, Pinedale Polychrome developed the first pottery in the Southwest with a true glazed paint, the direct ancestor of the later Zuñi types. Black-on-white pottery also reached a high level, both in designs and forms. Tularosa Black-on-white, developing in the Little Colorado, began its expansion south to establish the Salado Culture and to carry with it later polychrome types. Mesa Verde Black-on-white developed a



Masonry-lined rectangular kiva found at Turkey Hill Pueblo near Flagstaff. A ventilator opened out on the floor level from under the long wall. Boulder masonry is typical of this site, for it is in the mountain section.

very formalized design and outstanding shapes, in most areas considerably overshadowing Chaco types. To the west, throughout the Hopi country and as far as Flagstaff and the Tsegi canyons, early Tusayan and later Kayenta styles of design were developed.

Masonry shows considerable variation in technique and excellence of construction. The best was in the four corners area, where blocks were carefully shaped and coursed in thin walls and small rooms. To the west, irregular rocks were laid in abundant clay mortar, with much chinking with small spalls. Intermediate types are found to the south and perhaps in the center. The most elaborate and formalized kivas are

in the east, where all the features of the Mesa Verde type are present. This kiva was distributed down the San Juan to the Tsegi with only slight changes. The rectangular underground kiva is most typical of the southwestern part of the area, while incomplete evidence would indicate that the D-shaped kiva was most characteristic in the Hopi country.

Other cultural material is not particularly outstanding. The box metate was definitely established at this time and became the dominant form in later periods. Arrow points were predominantly triangular in shape and had either side notches or none. Sandals were flat and made in the twilled weave, the most typical form being the side-notched type. Weaving of cotton fibers became an important industry, and the presence of a large vertical loom is indicated. Beads were highly evolved, with many very minute types in a variety of materials. Ceremonial objects were equally varied.

Diagnostic features of this period consist largely of definite pottery types, masonry, local kiva forms, and the notched-toe sandal. A great deal of detailed information has been acquired about this culture and these times. Perhaps it is a result of this information that many regional variations are apparent and certain definite diagnostics are not so obvious as in those sections and times about which less is known.

The Classic Period is well dated both in its beginning and at its end — the beginning probably best in the western and eastern sections, the end by the great drought of the late thirteenth century. This drought was one of the great catastrophes in the history of Pueblo development and probably was the main contributing factor to the abandonment of the entire San Juan drainage at about A.D. 1300.

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Chapter XX

CULMINANT PERIOD A.D. 1300-1600

PUEBLO IV CULTURE STAGE

The Culminant Period is also one of the best-dated Southwestern periods, for it is marked at its beginning and end by catastrophic events. The beginning date is the end of the great drought, a date which has been very accurately established as close to A.D. 1300. The end is that time at which Spanish customs began to make themselves seriously felt on Pueblo Indian culture. Although the date 1540 might be chosen, as the time when Coronado first came in contact with the Pueblo people, Spanish culture certainly did not much affect Pueblo Indians before about A.D. 1600. It is for this reason that 1600 has been chosen as the end of the Culminant Period, or the last of the prehistoric periods in the Southwest. As will be seen from the following discussion, culture changes tend to fit these dates in most sections of the plateau with almost no overlapping.

With the abandonment of the San Juan during or at the end of the great drought, movements were south into the Hopi and Zuni areas and east into the Rio Grande and the intervening sections. This drift resulted in clusters of population, the densest portions forming several areas, three of which are sufficiently marked to warrant special discussion. These are the Hopi washes north of the Little Colorado River, the extreme headwater portion of the Little Colorado River, and the Zuni area. In the Rio Grande at this time many similar centers were forming. As permanent water appears to have been the primary determining factor in the choice of residence, other less well-known sections were also occupied. Many of the canyons draining the higher southern edge of the plateau had scattered sites, as did the Verde River valley in its northern portion, an area about Winslow, and the mountain section on both sides of the state line between Arizona and New Mexico.

An examination of the accompanying map makes clear the nature of this southern and eastward movement. At this time the total area of

concentration was greatly reduced, as was also the total Pueblo population. The attitude of southern migration led to the intermingling of both cultures and people and gave rise to a modified Pueblo Culture which is called Salado. To the east, in the Rio Grande, the basis of culture had been laid in early Basket Maker stages and was later modified by influences from both the Chaco and Mesa Verde. Certainly by now it had taken on a distinctive cast of its own. As the Rio Grande is outside the defined area of this discussion, it will be confined to a consideration of the Hopi, Upper Little Colorado, and Zuñi areas. Certain relationships of these areas may be pointed out now. Ceramically the Hopi area is distinct, and the Upper Little Colorado, which might also be termed the western Zuñi area, and the Zuñi area are the closest. Architecturally, at least as concerns kiva types, the Hopi and Upper Little Colorado are similar, and the Zuñi is distinct.

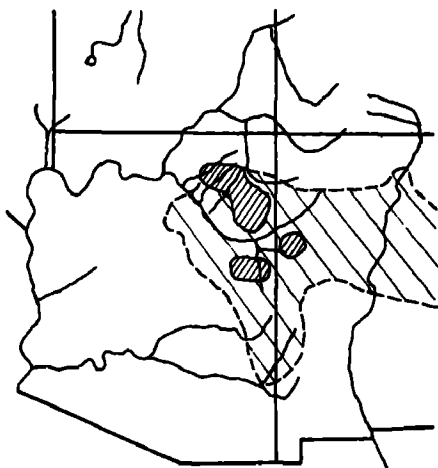


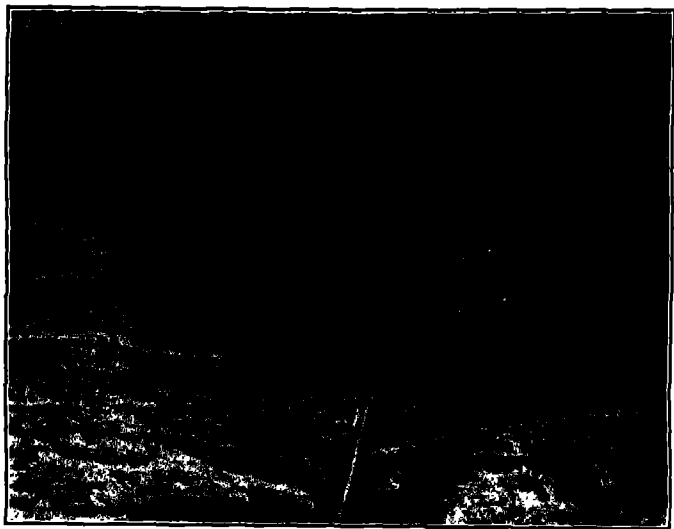
FIG. 135. Outline of area occupied during the Culminant Period. Three centers of concentration are apparent. These are the Hopi area to the north, the Upper Little Colorado area to the south, and the Zuñi area to the east. The San Juan drainage was abandoned, and population movements were to the south and east. Large sites were widely scattered over the area of greatest expansion. The southward extension formed one portion of the Salado Culture.

Beginning with the Hopi area for a detailed examination of pottery and house types, it is found that pottery fired in an oxidizing atmosphere had become the prevailing type. Some reduced black-on-white types were also being made, but these were certainly not predominant. This change in firing methods is of considerable importance and marks the serious acceptance of a series of yellow and orange pottery so characteristic of the Hopi Indians.

The ancestral form of the Hopi yellow series has been described in the preceding chapter. This was Jeddito Black-on-orange. From about 1300 on, the coarse sand temper found in this type was not included in the Hopi yellow types which became so common. This was probably the

result of the adoption of a clay found in the Hopi washes area which required no additional temper, as it already contained sufficient very fine sand grains.

A few of the most important decorated types which are characteristic of this period are Jeddito Black-on-yellow, Bidahochi Polychrome, Sikyatki Polychrome, and Awatobi Polychrome. Distinct but related types



Montezuma Castle is a cliff dwelling in the Verde valley with a Pueblo IV stage of culture. It lies in the mountain area of the state.

such as Jeddito Stippled and Jeddito Engraved should be mentioned also. All these form a closely related group, distinguishable largely on the basis of styles of decoration. The common utility pottery is also divisible into distinct types as based on the styles of ornamentation. The three most characteristic are Jeddito Plain, Jeddito Corrugated, and Jeddito Engraved.

Jeddito Black-on-yellow is obviously a direct outgrowth of the previous Jeddito Black-on-orange. The dates which have been assigned to it are about A.D. 1325 to 1600. It is therefore one of the best general diagnostics of the Culminant Period, for it not only conforms to the span of dates suggested but also is relatively widespread in the plateau as a traded type. It was fired in an oxidizing atmosphere. The paste is hard,

fine, yellow, and although it contains fine sand this sand is generally not visible to the eye. The surface is well smoothed by being compacted. The paints of the design are manganese, which fire black to brown. Designs are mostly geometric, but some life forms occur, such as that illustrated in the lower right-hand corner of the accompanying diagram. The forms are bowls, jars, and ladles, the most abundant of which are bowls. This is a strikingly beautiful, hard, golden-yellow pottery, which enjoyed much popularity in the Southwest at this time.

Two related types, which occurred later in the period, must be considered next. The first of these, Jeddito Stippled, has been dated as from about A.D. 1350 to 1600. This type is exactly like Jeddito Black-on-yellow except that part of the design is produced by stippling or spattering black paint onto the yellow background. The second type is Jeddito Engraved. It also is exactly like Jeddito Black-on-yellow but in portions of the black paint a pointed instrument was used to engrave fine lines through to the yellow background before firing. The dates assigned to this type are A.D. 1350 to 1600.

The second most important and certainly the most striking type is Sikyatki Polychrome. Dates assigned to it are A.D. 1400 to 1625. The paste and finish are the same as Jeddito Black-on-yellow, although in many specimens the surface has been even more carefully smoothed and polished. The difference in these two types lies in the nature of the decoration. Sikyatki Polychrome has a black and red decoration on the yellow

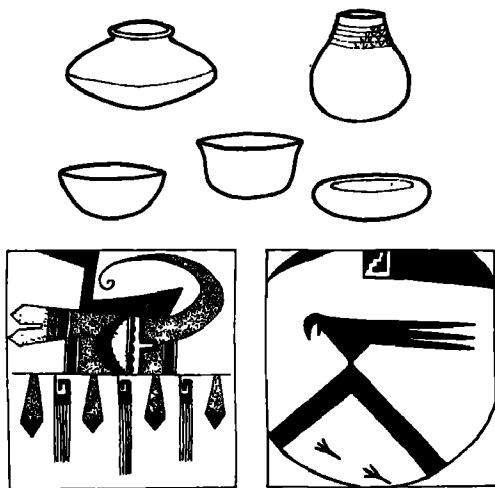
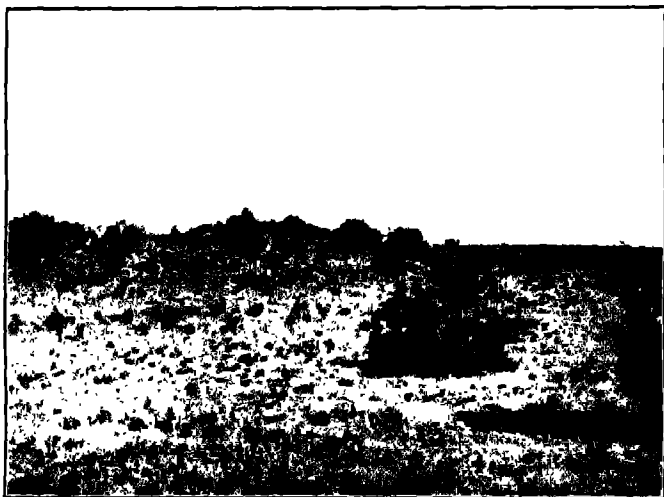


FIG. 136. Pottery forms and styles of design found in the Hopi area at this time. Both geometric and life designs are found. The lower left design is a polychrome type in which the background is yellow, black is black, heavy shading red, and light shading lighter red. The lower right figure is a design found on Jeddito Black-on-yellow. The upper right figure is Jeddito Corrugated.

low background. Designs may be either purely geometric or life forms, such as the lower left illustration in the accompanying figure. This is an extraordinarily pleasing and beautiful pottery type, often occurring in such striking and unusual forms as the jar and bowl in the upper left and lower right corners of the illustration. It is the type which was revived, largely through the efforts of Nampeyo, in the early twentieth century, and has since become the most characteristic modern Hopi pottery.



Kinnikinnick Pueblo, a Pueblo IV site, appears as a mass of crumbled masonry walls. It lies in the mountain section and is one of the large scattered sites of this age.

Awatobi Polychrome, which existed from about A.D. 1400 to 1625, is a further elaboration of Sikyatki Polychrome. The paste, temper, finish, and color combinations are the same, but the two techniques of stippling and engraving were both added to the design. The walls tend to be slightly thicker, and in at least some pots the execution is not quite so good as that of the previously described types. Vessel forms are all those pictured.

Probably one other type, Bidahochi Polychrome, should be mentioned. It has been tentatively dated as between about A.D. 1320 and 1400. The paste, temper, and forms are the same as Jeddito Black-on-yellow, and the designs are always geometric. One character alone marks

it as distinctive. The black design is outlined with a fine white line. Forms are both bowls and jars, the jars being more common. This type does not appear ever to have been very abundant.

The common utility pottery, like that of the present Hopis, is made of a yellow or brown paste and has a coarse sand temper. Three types are known, Jeddito Plain, Jeddito Corrugated, and Jeddito Tooled. Jeddito Plain might be considered the basic type and the others variants of it. The paste is yellow through an orange to brown, as is the surface. The surface is not carefully rubbed and in fact is usually quite rough, simply being scraped down. Fire clouds and other blemishes are common. Forms are jars and flat platelike vessels. The upper right-hand vessel in the figure is of this type.

Forms of this entire group of pottery are distinctive. Flat bowls with incurved rims are radically new. Probably the most distinctive form is the jar, shown in the upper left of the illustration. It is very broad in relation to its height and has a marked shoulder or change of angle of the body. The flaring rim bowl became very common late in the period, and the bowl with straight rim, as shown to the lower left, is most characteristic of earlier forms.

Sites of this period are of the general existing Hopi type as regards architecture. The earlier sites, or those which lack the later polychrome pottery types, have as a rule excellent masonry and generally cover about an acre of ground. Like the later sites they are formed in blocks of rooms grouped about one or more open plazas or patios. Later sites are much larger, covering as much as ten or twelve acres, and often formed in rows of buildings with long plazas between. It is these larger sites which are so similar to modern Hopi villages.

Many well-known sites are excellent examples of this period. Oraibi, Shungopovi, Mishongnovi, Chucovi, Ash Heap Terrace, and Sikyatki are located on or about the Hopi mesas. In the Jeddito drainage are Awatobi, Kokopnyama, Chacpahu, Kawaiku, Little Ruins, Nesheptanga, and Hoyapi, in the Polacca wash. Biddahooci, West Ruin, Homolovi Ruin one and two, Cottonwood Ruin, and Chevalon are all excellent and well-known sites.

As has been suggested, the kivas of the Hopi country and the Upper Little Colorado section are essentially alike. They are rectangular in form and average ten to twelve feet wide and about fourteen feet long. The distinguishing feature is a short banquette or bench at one end or side of the room which is set off in a niche about three feet deep. For

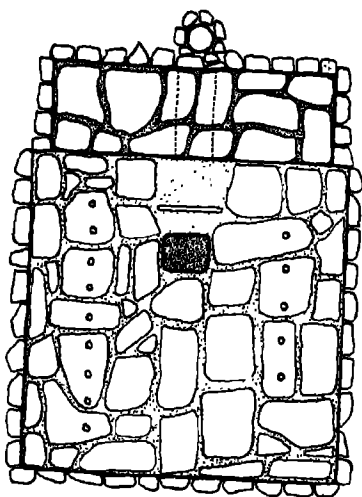


FIG. 137. Kiva type characteristic of the Hopi area. All are rectangular, have a short bench at one end, ventilator, deflector, and firepit. Many have loom holes in the stone flagging floor.

See Fig. 138. The surface is covered with a clear bright red slip on which designs are painted in black outlined in white. The black paint is a true glaze paint containing lead and copper; the white is chalky and not very tenacious. Both black and white are found on the inside and outside of bowls. Designs are characteristically purely geometric. Jars have white painted necks, with simple repeated black elements, such as crosses, distributed about them. The remainder of the body of the jar is slipped red,

details see Fig. 137. A ventilator usually extends under the platform to open onto the surface. There is often a deflector between the ventilator opening and the firepit. The floor is characteristically paved with stone flagging and often has loom holes in it, as shown in the illustration. Almost an invariable feature is the presence of one or more rectangular sandstone loom blocks.

In the Upper Little Colorado section only one important new pottery type was produced at this time. During the preceding period Pine-dale Polychrome had been evolved, and from this Fourmile Polychrome quickly developed. The paste is light gray in color, and it is tempered with ground-up pot sherds. Vessel shapes are bowls and jars.

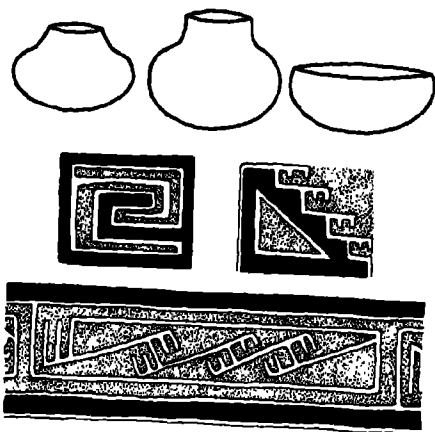


FIG. 138. Fourmile pottery forms and designs. Black is black, white is white, and shaded is red. The lower design is typical of the outside of bowls; the upper ones are elements found on the inside.

and the black and white designs are confined between two horizontal black bands. The date has been tentatively assigned as between A.D. 1350 and 1400.

Present information indicates that no very long occupation of this area occurred. This appears to have been the latest pottery made here, although the closely related Zuñi types carried through to historic times. As has already been indicated this type of pottery enjoyed an extension into the mountain section to the south and so formed a northern component of the Salado Culture.

Masonry seems to have been cruder than that of the preceding period, for unworked rocks were laid up with only a casual attempt at coursing, and walls were covered with a heavy plaster. The most typical sites of this area are Pinedale and Sholow Ruins.

The characteristic Pueblo arrangement is a mass of room blocks surrounding a rectangular plaza. From present fragmentary evidence it would appear that they were seldom over one story in height.

In the eastern Zuñi area a great variety of pottery types was produced. They might be most broadly distinguished by the general use of glaze paints in several colors. Almost always the glaze pigment was poorly applied. Possibly because the pigment contained gritty masses, it was difficult to apply, and was often visibly piled on the surface of the pot. In many specimens it appears to have run slightly. Had these people not been disturbed by the arrival of the Spaniards it is conceivable that they might have evolved the technique of slipping vessels with a glaze, and so have independently produced a waterproof pottery.

Pinnawa Black-on-red, Heshotauthla Polychrome, Pinnawa Polychrome, Adamana Polychrome, Wallace Polychrome, Hawikuh Glaze-on-white, and Arauca Polychrome are all types with glaze paints which may be ascribed to this general area and culture. Pinnawa Red-on-

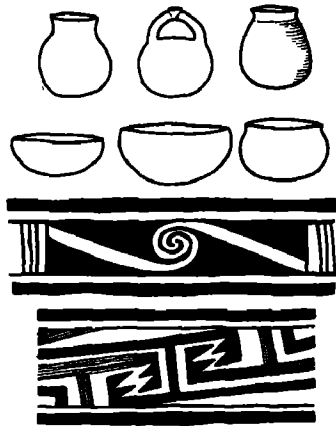


FIG. 139. Forms and designs of Zuñi glaze types. The upper right-hand figure is a fine corrugated type often found with glazes. The upper band design is found on the outside of bowls, the lower on the inside. Glaze paint tended to run and was not carefully applied.

white is a non-glazed type which is also of this general series. As this material does not bear directly on immediate problems no attempt will be made to discuss it in detail here. Figure 139 illustrates a variety of forms and shows two characteristic examples of interior and exterior decoration in glaze paint.

Masonry in this section is sandstone blocks set in adobe mortar, similar to that of the Hopi area. Houses are grouped into blocks about courts

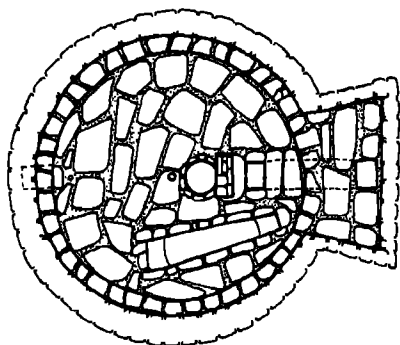


FIG. 140. The smaller of the circular Zuni kiva types. These structures average about seventeen feet in diameter. The distinguishing feature is the presence of a platform on one side. Ventilators run under the floor, and there are a deflector, firepit, and "sipapu." The narrow bench is always present.

and they are of approximately the same size. Kivas, however, are markedly different, being most closely allied to the late Chaco Canyon and Mesa Verde circular structures. Both have narrow benches encircling the floor, and both types contain sunken rectangular chambers. Ventilators open to the outside and run under the floor to just in front of the firepit, instead of opening at the level of the floor at the side of the bench. This is a feature which was found in the Chaco type of circular kiva. The ventilator, deflector, firepit, and sipapu are all present, and usually form a straight line bisecting the structure. The

two types differ only in that one has an expanding bench or platform on the side in which the ventilator is found. This is the smaller of the two, averaging only about seventeen feet in diameter. The larger type is also circular but does not have the expanded bench. It varies from as little as nineteen to as much as fifty-five feet in diameter. The masonry of both is well laid of coursed blocks.

In general the culture of this period is very similar to that of the preceding. Certain techniques were elaborated and some crafts were more highly specialized, but all basic methods of manufacture were well known in earlier times.

Physically, individuals were light framed and the skulls were deformed posteriorly. Burials vary locally between flexed and straight, and are found under the floors of rooms, in sealed rooms, or more commonly in definite burial plots. Both trash mounds and sand dunes were

used as burial plots, and because the sand dunes were often not immediately within the confines of the village such burials are rather difficult to locate.

Although a few trough-shaped metates are found the most common form seems to have been a flat grinding slab. These were mostly contained in mealing bins, as already described, but a few of them may have been used without bins. The most common mano was triangular in cross section. The axe in those sites which have been most carefully studied is the three-quarter-groove type, although nowhere in the plateau do axes ever appear to have been very abundant. It is the feeling of the writer that the three-quarter-groove axe was never made by any people living in the plateau, unless they were of Hohokam or Mogollon extraction. The very rare full-grooved axe was the most typical plateau type. Full-grooved mauls are very abundant and very well made. Hammer stones, of course, are very common. Mortars and pestles are rare but do occur in certain sections and sites, as do odd-shaped paint palettes.

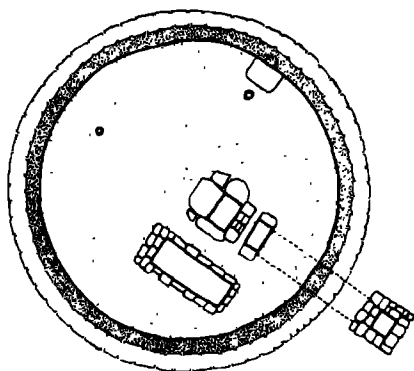


FIG. 141. The larger circular type of Zuni kiva. This type lacks the platform but has all other features including a floor cist. The size varies from nineteen to as much as fifty-five feet in diameter.

So far as the writer is able to learn the predominant type of arrow point is the triangular form already described. The most widespread type appears to have a square base and lateral notches, although some with slightly concave bases and no notches occur. See Fig. 132.

One of the most characteristic features of this period is the presence of one or more loom blocks in almost every kiva excavated. Generally they are found in pairs. These blocks were used in the first stages of setting up a loom before it was raised from the horizontal to the vertical position. Poles were set into the shallow depressions in the blocks, and the other end was supported by niches in the side wall of the kiva. The warp threads were then wound between the two poles to space them properly before they were raised to the weaving position. These blocks, always made of sandstone, average about seven by eight or ten inches.

Surprisingly enough very little specific knowledge has been obtained

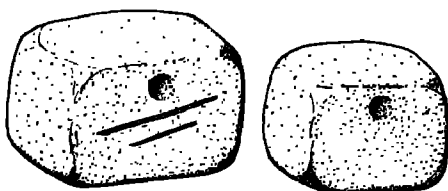


FIG. 142. Sandstone kiva blocks such as these are very characteristic of this period. They always contain one or more depressions for the reception of poles in the first stages of setting up a loom. One or more are almost invariably found in kivas.

concerning basketry. The yucca ring basket and coiled basketry must have been made, for these types have survived to the present. Sandals are also unknown to the literature, although matting has been commonly found.

Fabrics in the large open sites of the plateau were not preserved. However, from the salt mines in the Verde valley, a region just below the pla-

teau, and in the mountain section some of the most exquisite fabric fragments from any period have been found. They are of interest be-

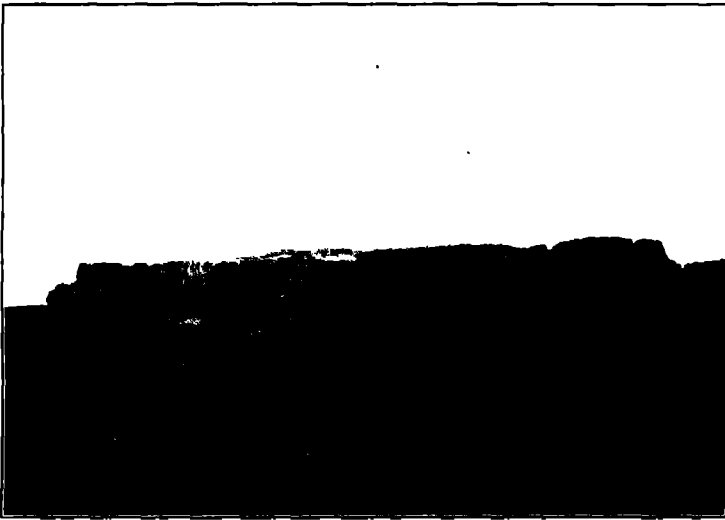


Walpi is the easternmost of the Hopi pueblos and is an excellent example of present Hopi villages. Defense was the motivating cause of removal of these sites to the tops of easily defensible mesas.

cause of their remarkably fine threads, the variation of color and weave shown, and their abundance. Probably the manufacture of cloth fabrics reached a very high level in the mountain section now, but it was also well developed in the plateau.

The use of the bow and arrow is definitely indicated by the presence of arrow points as well as by the fact that it was in use historically. The rabbit stick must also have been in use because of its survival. The stone knife was still common.

Although very little is known about foods in use at this time it is certain that corn was the staple. Animal bones which have been recovered



Acoma Pueblo in northwestern New Mexico, like the Hopi towns, is located on the top of a mesa. This was a defense measure resorted to most typically after the arrival of the Spanish.

from the various sites include a long list ranging from the larger mammals, such as mountain sheep, deer, elk, and antelope, to all the small rodents.

Ornaments show little change. The use of turquoise probably became more nearly universal. Wooden ear pendants, covered with turquoise mosaics, seem to have been very common.

Ceremonial artifacts are in no way different from those of the preceding Pueblo periods. Many of the kivas which have been excavated

have murals painted on their walls, but this trait was also known from previous periods. Small stone animal figurines are not uncommon and are actually relatively abundant in the Rio Grande sites. Wooden staffs, wands, birds, and similar objects were probably made.

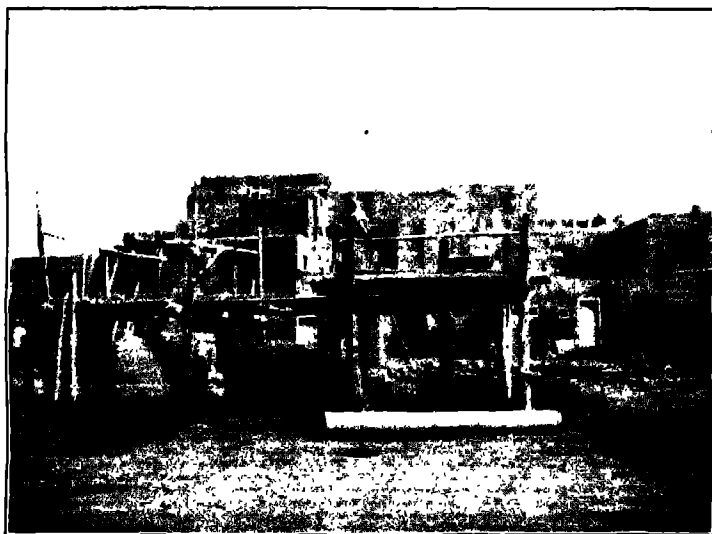
In summary of this period only a few features are sufficiently characteristic to be worthy of special note. The end of the great drought marks the beginning date. The abandonment of the San Juan area, and the forming of three marked nuclei of populations with relatively uninhabited intervening areas, are an important feature. In the Hopi country pottery fired in an oxidizing atmosphere has yellow backgrounds and often polychrome designs. Large pueblos of several acres were characteristic. The plaza contained one or more rectangular kivas with a platform set in a niche at one end. In the Upper Little Colorado area occupation was only for a short time during the early portion of this period. Houses were also in the form of pueblos, although smaller, and had essentially the same kind of kiva described for the Hopi area. Only one type of pottery, Fourmile Polychrome, is distinctive. This had a black glazed paint. In the Zuñi area, pueblos were also characteristic but the kiva type was round instead of rectangular. These kivas are of two types, those with enlarged platforms at one section of the bench, and those without. They are very strongly reminiscent of the Chaco Canyon and Mesa Verde types of earlier times. Material culture shows little variation from that of earlier periods and certainly did not make any radical departures from preceding types. Techniques in certain specialized industries became more involved, and local specializations took place. The period closes with the introduction of the first Spanish influence of any consequence, at about A.D. 1600.

Although it is not the specific problem of this book to consider the history of the Historic Period, or that from A.D. 1600 to 1900, a few comments might be made. The only areas occupied in the plateau at this time were the Hopi and Zuñi sections. Sites became increasingly larger as the menace of the Navahos and Spanish raiders increased, and later in the period most of the sites in the open were moved to the tops of mesas as a defense measure. Here they have remained ever since, although in the last few years there has been an increasing tendency among individuals to move down onto the flats again.

Ceramics deteriorated steadily from the beautiful Sikyatki and Awatobi Polychrome types, until the revival at the end of the period. The flaring-rim bowl became a common form, and styles of design similar to

those in use by the Zuñi today were introduced. European forms were copied from Spanish vessels, but apparently they never became popular except for water bottles and canteens. Utility types with coarse sand temper continued to be made in great quantities.

The rectangular kiva with an end platform is still typical. Masonry has remained of about the same quality. Certain Spanish influences, such as stairways, ovens, and chimneys, are apparent, but the general plan of the pueblo has remained practically unchanged. It has only been during



Taos Pueblo is the farthest northeastern pueblo. It is located in the northern part of the Rio Grande drainage and shows a few characters of plains culture.

the Modern Period, since about 1900, that any significant alterations have been effected. Certain groups have split from the older conservative elements and established more European style villages. Some still more radical individuals have even established homes in the flats away from the mesas where agriculture is more profitable.

Weaving remains one of the major arts of the men, although the Spanish introduction of wool instead of cotton caused a change in those articles not of a ceremonial nature. Metal working was also introduced either by the Spanish or Navahos, and such objects as rings, bracelets, earrings, bow guards, and similar ornaments are made. Sheep herding

has offered a new vocation to many individuals, as well as a permanent supply of meat, since sheep were introduced during the Historic Period by the Spaniards.

In all basic respects the Hopi even of today is living essentially the same life he was living four hundred years ago. His houses are the same, many of the objects of everyday use are the same, and his general economy is little changed. Only certain objects, such as those made of metal, are radically different.

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Chapter XXI

SUMMARY OF PLATEAU HISTORY

In the preceding chapters it has been indicated that two distinct but related cultures flourished in the plateau area. The Basket Maker, the earlier of these, changed at about A.D. 700 to Pueblo. This change was occasioned by the introduction of a new group of people into the plateau, a group who mixed physically and culturally with the Basket Makers and so contributed to the production of the second distinctive culture. More specific information has been obtained on the development of these two groups than on any others in the Southwest, and perhaps more than the prehistoric "history" of any comparable area in the world.

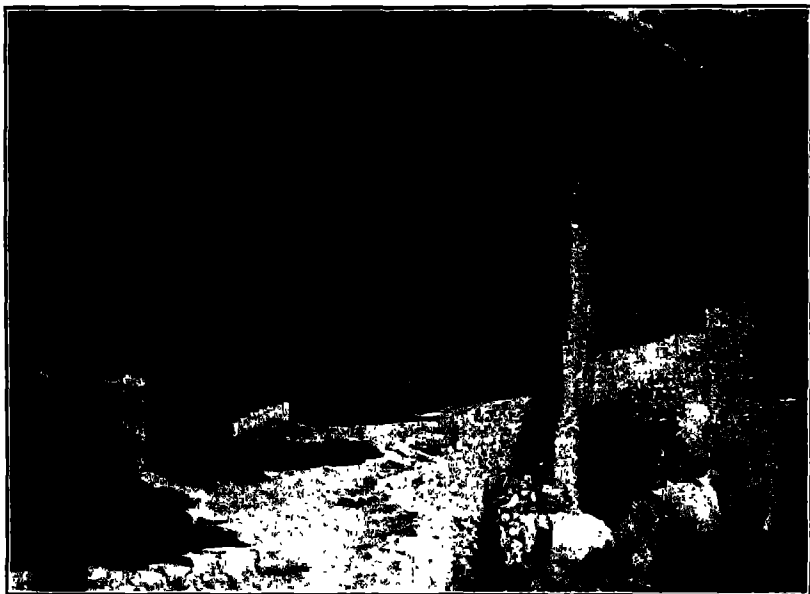
Nowhere else has it been possible to assign an abundance of absolutely accurate dates to wholly prehistoric horizons. Tree-ring dating throughout the plateau has made it possible to date every cultural stage represented and to assign quite accurate duration dates to all periods with the possible exception of the earliest. To supplement tree-ring data an elaborate method of cross dating sites by ceramics has led to the assignment, in terms of our own calendar, of all the major sites which have been dug in this area. By the same method the dates of a great many unexcavated sites may be estimated with some accuracy.

Archaeological exploration and intensive excavation have been longer under way here than in either the mountain or the desert sections. Many thousands of dollars and the efforts of a large group of capable individuals have been directed to unraveling the history of the plateau. This was the area where the first sequence of cultural stages was pointed out, and the most detailed ceramic and other studies have been made.

In comparison to the plateau both the desert and mountain sections are comparatively youthful in their command of serious archaeological investigations. Only within about the last ten years has Hohokam Culture been accepted as distinct from that of the north, and Mogollon Culture is of such recent recognition that it is still in the first stages of

examination. To the west, Patayan Culture has been seriously studied only within the past few years.

As a result more detailed information should certainly be expected from the plateau than from any other area in the Southwest. The preceding six chapters have been devoted to a brief exposition of this detailed history. Even in such a review many great unknown portions are apparent. Probably the most striking lack of detailed information is found in the entire central Hopi area in the earlier periods. The natural attrac-



Balcony House in the Mesa Verde is chiefly of interest because of the presence of a balcony at the level of the second-story floor. It is shown to the right in this picture.

tion of large sites for excavators, which has been pointed out repeatedly, has been a chief contributing cause to a lack of interest in this section of the plateau in early and unimpressive portions of its history.

The most intensive examination of the earliest period has been made in the San Juan drainage area. Not only has the immediate San Juan been investigated but the four corners area as well. Here in the natural caves formed in the box canyons a culture which is best represented by perishable materials is most completely preserved. As a result the Basket Maker II stage of culture which probably flourished from about A.D. 300

to 500 is best known from what may eventually be demonstrated to have been only a part of its range.

This true Basket Maker Culture is one of the most distinct cultures known in the Southwest. The physical type, economy, and general pattern of living were so markedly different from any others that it is not surprising that the culture was early recognized as distinct. Physically the people were not of so Mongoloid a cast as later groups, and possibly they had lighter and wavier hair and heavier bones than their successors. Their skulls were never deformed at the back, for they strapped their babies to cradles which had been padded with soft material under the head of the child.

Basketry was an important industry with this group, one of the most characteristic material traits being the use of large shallow coiled baskets which were often placed upside down over the head of the dead. Pitched water baskets, carrying baskets, trinket baskets, and a variety of other forms were all made and used. Other containers were of gourd or squash, often hung in cord nets. Cotton was unknown, but a great deal of cordage was made from yucca and apocynum fibers, some of which was used in the manufacture of coil without foundation bags. Human hair cord was also used for ties and other purposes, the women bobbing their hair to secure this material. Small whole animal skin pouches were characteristic. A warm and serviceable blanket was made from cords wrapped with feathers or fur to supplement the scanty clothing commonly worn. Sandals were of coarse twined weave, and square toed, though sometimes with a toe fringe of buckskin.

These people apparently did not have substantial homes, for even in the caves only the crudest windbreak shelters are found. However, they did have well-made cists or storage bins, which were sunken, circular, and often slab lined. In these they stored food, hunting equipment, spare clothing, supplies, and other valued articles, and often buried their dead.

Hunting equipage consisted of the atlatl and atlatl dart. The dart was a light spear with a detachable hardwood foreshaft which was propelled with the atlatl, or throwing stick. Neither range nor accuracy was great, and in comparison with the bow and arrow it must have been a relatively ineffectual weapon. Large animals were hunted, but smaller animals were trapped in a great variety of most ingenious snares and nets. The economy was about equally divided between hunting and agriculture. Agricultural products consisted only of a small rounded-

grain yellow flint corn as the staple, supplemented by squash and perhaps sunflower. There is some question whether or not the sunflower was domesticated, but present indications are that it was, at least in some sections. A great variety of wild seeds and nuts were collected and eaten. Agricultural implements consisted of sticks, both pointed for planting and bladelike for weeding. This is in marked contrast to the use of the stone-blade hand hoe.

Ornaments were, as a whole, relatively simple. A great use was made of bright-colored feathers which were tied to the hair or on sticks which were worn in the hair. Wooden hair combs, sometimes decorated with beads or other objects, were also worn. Long cylindrical stone beads were characteristic, and pendants were not uncommon. The most distinctive feature was the choker type of necklace, which was fastened in the back with a toggle arrangement. Small ornate seed and shell beads were prized. Cylindrical or cigar-shaped stone pipes, very beautifully made of slate and other materials, are characteristic of this group.

Bone objects were dice, awls, and whistles. All three of these in one form or another persisted to much later periods.

The life of these people must certainly have been semi-nomadic, for the type of economy would not have permitted a highly sedentary existence. Nowhere is any great population indicated, so that the mortality rate must have been high. The fact that caches are often found which contain quantities of valuable material suggests that they were in the habit of leaving a section and returning to it, and it is quite possible that one small band lived over a considerable area, to leave widespread but scattered indications of their presence. Withal their existence must have been difficult and precarious, for they occupied an inhospitable portion of the Southwest.

The next period, that between about A.D. 500 and 700, shows a slightly higher cultural development in many respects. This stage, Basket Maker III, must have come in contact with a new invading group which effected certain drastic changes in the type of life before the end of the period. At the beginning, however, the general culture remained much the same. The single trait which may be considered as most definitely marking this culture stage from the preceding is the building of true homes for the first time. These were circular, or nearly circular, pithouses, some of which were slab lined to hold back the loose soil, others of which were merely clay lined in substantial soil. The method of roofing varies from poles set on the periphery of the hole and brought together at the top

to form a dome, to a four-post flat-roofed arrangement. To the east some essentially circular pithouses show a second smaller chamber that might be termed an "annex."

Fabrics, though employing the same materials and techniques, show in some instances a further development. This is particularly marked in the production of fine crescent-toed sandals, the upper surface of which



A portion of Kiet Siel Pueblo showing characteristic arrangement of house blocks and in the center a circular kiva.

often has colored designs, the lower surface raised designs. Baskets, bags, and feather and fur blankets remained much the same.

Sometime, probably after about A.D. 600, sun-dried pseudo-pottery was produced by lining baskets or modeling flat traylike vessels. These were tempered first with shredded cedar bark, later grass, and finally sand. Soon these vessels were being fired, and the first true pottery of the plateau was produced. The paste and surface color was gray; the sand temper showed through to the surface, which was only roughly smoothed; and the shapes were globular and copied after natural forms

already in use. The only true spouts ever produced in the Southwest were made at this time.

Designs in a dull black paint were soon painted on the insides of bowls and the outsides of jars. In the beginning many of them were obviously copies of basket designs, but experimentation followed, and human and other unusual figures were produced. The elements most commonly used were coarse lines and unattached dots.

At about the same time crude human female figurines were modeled in clay. The eyes were slits, the nose a pinched-up mass of clay, and ornaments were indicated by punched decorations. Peculiar conical clay objects, of unknown use, were also made and ornamented in a similar manner.

The economy of this group was only slightly different from that of the preceding. Agriculture had become somewhat more complex, and larger types of corn were either developed or introduced. Very late in the period beans were added to the list. The production of houses made possible a more permanent form of life in the open and in areas which before had been inhospitable. An expansion of the area occupied may be noted, and probably a substantial increase in population took place.

Almost at the end of this period certain new features appear for the first time. In the east the physical type began to change slightly from a predominance of long-headed types to more rounded skulls, although the posterior was still not deformed. Beans were introduced, and the bow and arrow made its first appearance. A very rare black-on-red type of pottery may probably also be ascribed to this same outside source, for it is better made and radically different in basic firing methods from that produced by the Basket Maker people. Thus the first indications of an encroaching group are apparent.

At about A.D. 700 certain further changes in culture became established. This marks the beginning of the development of the distinct Pueblo Culture. The first period which has been isolated lasted from about A.D. 700 to 900 and is designated as a Pueblo I stage. It has been referred to as an adjustment period, and it was certainly that, for a group with one set of well-established traditions found it necessary to adjust themselves to a new set of customs.

It has been suggested that this change was occasioned by the encroachment of new people who, mixing with the occupants, produced this new culture. To substantiate this claim several radical changes have been mentioned. The physical type was modified, and a hard

cradle head support was introduced to flatten the back of the skull. The bow and arrow replaced the atlatl. Cotton was introduced soon after beans. The coiling technique of pottery manufacture became widespread, and styles of decoration were formalized and standardized. The first masonry surface structures appeared and soon became highly evolved. Last, but perhaps of the utmost importance, at least at one site in southern Utah, oxidized pottery was introduced in some abundance.

An attempt has been made to identify this invading group as basically of Mogollon Culture. Because of the lack of detailed knowledge of the Mogollon it is impossible to be certain that this was definitely the source, but several traits would tend to substantiate such a suggestion. The earliest changes from Basket Maker took place in the eastern portion of the San Juan drainage. It was also here that the most rapid later developments are found. This section is geographically close to the Mogollon mountain area. The basic coiling technique was first employed by the Mogollon people, and they were also producing a well-made brown and red pottery when the Basket Makers were struggling with their first individual experiments. One definite Mogollon trade piece has been found in a Basket Maker site. Axes of any sort were very rare in the plateau during the earlier periods, and those which have been found are of a full-grooved type. Before A.D. 700 they were so rare as to be considered practically non-existent, but after about this date they became more common. Types of axes found in the Mogollon and Pueblo areas are identical in the early periods of both. These are full grooved and either chipped or ground to shape. Later the full-grooved axe became the only type characteristic of pure Pueblo Culture. From this it is apparent that the contributing factor to the change of culture may well have been the introduction of Mogollon people to the plateau.

As very little detailed work has been done on pure Pueblo I sites not a great deal is known about the material traits of this culture stage. Certainly the best-recognized single trait is pottery. Two types became general at this time. Jars were produced with flattened, but not indented, neck coils. This type is known as Kana-a Gray. The paste and surface finish are similar to those of the previously discussed Basket Maker Lino Gray type. The second type is black-on-white, which is better made, and the decorated surface of which is universally more carefully prepared than the earlier black-on-gray Basket Maker type. Design elements of fine lines, attached dots, and high triangles were widely

accepted. Forms were still predominantly globular but more varied than those of the preceding period. The first true handles were made now.

From this time on, Pueblo Culture enjoyed a steady rise. During the next period, or from A.D. 900 to 1100, regional variation became much more marked, and both a general Pueblo II and a Pueblo III stage of culture flourished in separate sections contemporaneously. Because of the greatly varied culture enjoyed in the several regions, and since this



Masonry such as this which was used to line a pithouse near Flagstaff is a good example of the boulder type widely used in the mountain section. This house was dug by the Museum of Northern Arizona.

material has been discussed in a preceding chapter, no effort at a detailed review will be undertaken in this summary.

Certainly the cultural leader of the plateau was now Chaco Canyon. Here the greatest sites flourished, the most spectacular structures were built, and a specialization of the arts led to a very high local attainment. Elaborate jewelry, with much use of turquoise mosaics, and fine pottery were produced. Kivas became prominent and developed to great size. A very large population was concentrated in a small area.

Just to the north, in the Mesa Verde, but still in the general four corners region, smaller surface masonry structures were being built.

Here the small kiva was highly elaborated with the banquette, pilaster, platform, ventilator, deflector, firepit, sipapu series of features. Masonry was remarkably well made, only a small amount of adobe mortar being used. Pottery, though not so fine as in the succeeding period, was well made.

In the lower San Juan both pithouses and surface masonry structures were in use. Masonry was of a small amount of rock and a greater proportion of adobe. Ceramics, though influenced both from the south and the east, were of a general southern type. South throughout the Little Colorado area and the Hopi country, houses were generally pit structures. The black-on-white pottery had a tendency to simple designs and the use of wide lines and low flat triangles. Throughout the entire plateau area the most common and characteristic general-utility pottery type was Tusayan Corrugated. This was a fine, evenly indented corrugated type which serves as one of the best widespread daters in ceramics.

In general this period represents a time when Pueblo Culture was entrenched itself in the plateau. Traditions were being established which would mold its future course. Surface masonry structures were developed in practically all their characters, and specialization in the arts led to their rapid evolution. Population concentrations were as a result inevitable, and although this period had the greatest population of the plateau, it also marked the beginning of a decrease.

The Classic Period, from A.D. 1100 to 1300, was the time of general development and further refinement of these trends. Pueblo III Culture was in full swing now, and the entire San Juan, Hopi, and Little Colorado areas were dotted with large pueblo sites. The attraction of these sites for excavators has led to a thorough understanding of this culture, and so a great many pottery types are well known. Not only did black-on-white and corrugated types continue to be made in even more refined form, but also the first polychrome types were produced. These were uniformly fired in an oxidizing atmosphere and were decorated with black, red, orange, and white colors.

Chaco Canyon culture had by now spread to other areas and taken on a complexion strongly tintured by the cultures with which it came in contact. The Mesa Verde was at its height, and at this time evolved the outstanding square, round, and D-shaped towers which so definitely characterize it. In the western San Juan the large cliff dwellings and mesa pueblos which are so well known were flourishing. Throughout the Hopi country sizable pueblos had developed, and the first of the

yellow pottery series made its appearance. In the Upper Little Colorado area two types of distinctive pottery had evolved. The first of these, Tularosa Black-on-white, spread rapidly to the south and formed the vanguard of the Salado Culture. The second, St. Johns Polychrome, became one of the most widely traded types ever produced in the plateau, and hence one of the best dating types in the Southwest. The first glaze painted pottery also appeared at about the end of the period in this area as the ancestor of the later greatly varied Zuni types.



One of the earliest box-type metates found in the Flagstaff area by the Museum of Northern Arizona. This type became predominant in later sites.

No basic additions or alterations were made in the general culture during this period. Sites were on the whole larger and more imposing than previously, but they were not quite so large as those of the next period. Pottery types were highly developed and considerably diversified. A widespread manufacture of oxidized pottery marked an increasing interest in this method of firing. The specialization of industries which attended the creation of larger sites and population concentrations appears to have led to a greater interest in weaving. Sandals had by now changed to a preponderance of twilled forms, and the yucca ring basket became very common.

In all respects the culture of this period is relatively high. The popu-

lous sites show that conditions of life were satisfactory, and the lack of general defensive features would indicate that it was moderately peaceful. Populations tended to be concentrated in relatively small areas, at various times, with sections of sparse populations intervening. This was probably a result of the "Human Cycle" whereby an area was rendered unfit for residence after a certain period of human occupancy. These conditions were altered only at the end of the period by the great drought. This was certainly the most general catastrophe that ever overtook the Pueblo people, for it immediately resulted in the complete abandonment of the entire San Juan drainage area.

The people who left the San Juan moved south to sections of more permanent water supplies, clustering during the following period in three areas. These have been designated as the Hopi washes area, the Upper Little Colorado area, and the Zuñi area. Although not discussed in detail there were other settlements in the Verde Valley and near Winslow. Certainly at this time there was also a considerable movement of people to the Rio Grande.

In the Hopi section large compact pueblos were being built which contained one or more courts or plazas, with rectangular kivas with a platform at only one end. The Hopi yellow pottery series had its development now, to culminate in the elaborate polychrome types produced near the end.

Occupation of the Upper Little Colorado area was confined to the earlier portion of the period. Pueblos, though smaller than the Hopi type, were similar, and the kiva was suggestive of the Hopi type. A black-and-white-on-red pottery developed with a black glaze paint, and spread south into the upper drainage of the Salt River, but did not survive long.

In the Zuñi area pueblos were more suggestive of the Chaco Canyon types. Kivas were round instead of square, and some were of exceptional size. Pottery interest may be characterized as showing a marked preference for glaze types of paint, and a variety of color combinations was produced. However, glaze painting did not persist far into the Historic Period.

General culture showed almost no changes from that of the preceding period. All the arts and crafts were carried on and perhaps further elaborated, but in general this time might well be considered a culmination of Pueblo history. By about A.D. 1600 Spanish culture was beginning to make itself felt in sufficient strength to color Indian culture. A substi-

tution of certain articles of European manufacture quickly took place, and the purely Southwestern Indian began a very gradual metamorphosis.

During the Historic Period, from A.D. 1600 to 1900, these gradual alterations accumulated. Fear of the Spaniards led to the location of pueblos on high mesas where they might more easily be defended, and

	HOPI COUNTRY	FLAG- STAFF	SAN JUAN	MESA VERDE	CHACO	ZUNI
1900	P. I.					P. I.
1600	P. II.					P. II.
1300	P. III.	P. III.	P. III.	P. III.		P. III.
1100	P. II.	P. II.	P. II.	P. II.	P. III.	P. II.
900	P. I.	P. I.	P. I.	P. I.	P. I. & P. II.	P.
700	B.M. III.		B.M. III.	B.M. III.	B.M. III.	
500			B.M. II.			
300						

FIG. 143. A table presenting the various sections of the plateau which have been discussed, and the culture stage represented in these sections at various periods. Lack of data may be a lack of knowledge and not an absolute absence, as in respect to Basket Maker II stage of culture which may be much more widespread than indicated.

here they still perch. The encroachment of raiding Navahos and lesser Apaches led to further entrenchments, and caused the conservative Hopi Indians to retain many more of their former customs than many other Indian groups.

Two charts have been prepared in an effort to aid evaluation of the cultural history of the plateau area. The first of these, Fig. 143, shows the stages of culture found in each of the culture centers at various periods. The most complete series probably is found in the Hopi country, where the descendants of the earliest prehistoric Indians are still to be found living. The shortest definite sequence of one culture in one area is in Chaco Canyon, where it was dispersed shortly after A.D. 1100. This fact may be readily explained, for a large population was concentrated within about fifteen miles in a narrow canyon. The destruction of the cover led to the lowering of the ground water and the eventual necessity of abandonment. That it was later reoccupied after it had once more silted up is apparent by the superimposition of a Mesa Verde type of culture at Pueblo Bonito.

Periodic abandonment may be even better demonstrated in the Tsegi Canyon system, and shifts of population peaks may be shown between the Tsegi, Marsh Pass, Moenkopi, and Wupatki areas. There were sudden and considerable population increases in the Tsegi Canyons in about two-hundred-year cycles which culminated at A.D. 1300. Before this, A.D. 1100 saw a large population, as did the early portion of the tenth century. Alternating roughly with this, population increases may be noted in the Marsh Pass area, at the mouth of the Tsegi canyon. This may best be accounted for by the erosion of the canyon, a result of the human cycle occasioned through occupation. This pulsation was felt as

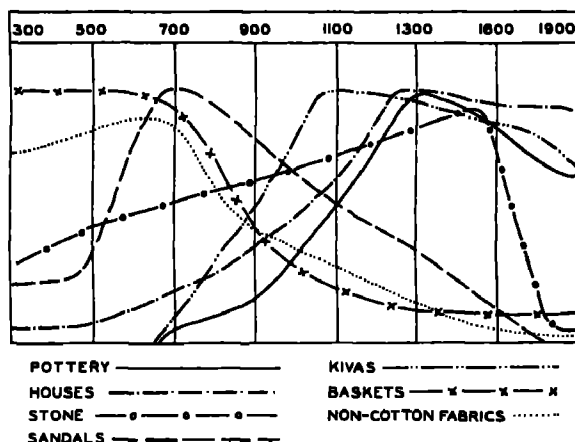


FIG. 144. Chart roughly indicating the relative excellence of several culture traits found in the plateau area at the time periods indicated by the dates at the top of the chart. General trait combinations or traditions have been chosen for this comparison. Reference to Fig. 65, which is a similar comparison of Hohokam traits, will show the similarities and differences in trait peaks in the two cultures.

far south as the Wupatki monument area where maxima were reached at about alternate periods.

The second chart is an effort to present, in the most general manner, a comparison of relative attainment of several traits developed in the plateau at various times. For this comparison pottery, houses, kivas, baskets, stone articles, sandals, and non-cotton fabrics have been considered. The most interesting result is the obvious production of two peaks. One of these is reached at about A.D. 700 and the second sometime between about A.D. 1200 and 1400. It will also be noted that two

distinct complexes of traits form these separate groups, the earliest of which is based on work in soft materials, the second in hard objects or materials. This shift in emphasis has been pointed out as a diagnostic of the two distinct cultures found in the plateau. At an intermediate period, around A.D. 900, these traits were crossing, and this is about the time designated as a period of cultural adjustment.

If this chart is compared to Fig. 65, which is in part a comparable evaluation of Hohokam Culture, it will be seen that a somewhat similar situation existed in the two areas at about the same time. In the Hohokam the great period of change was slightly later but just as distinct, for two peaks were achieved in the traits considered. In general it may be assumed that the year A.D. 800 was one of considerable culture alteration throughout most of the Southwest. At this time traits were both rising and falling in both these two major areas. When individual traits are compared in the two charts considerable time variation of peaks may be noted. In almost every comparable feature the Hohokam is found to precede the Pueblo by several years.

Chapter XXII

THE SALADO BRANCH, A.D. 1100-1450

Reference has been repeatedly made throughout preceding chapters to the Salado Culture, but only in the most general manner. Actually, although a good deal of work has been done on this culture, very little, as such, has been definitely published on it, and as a result most South-western archaeologists are somewhat vague as to just what it constitutes. Most of the reports which deal with Salado material have included it more or less mixed with other traits, which are generally not identified as distinct. Thus, although the general outlines are rather well known, many details concerning the associated traits are not clearly understood.

The Salado Culture might be defined as the intrusion of a Pueblo-derived culture into the Gila drainage area. The origin of the Salado on the plateau has already been discussed and its southward spread suggested. It might be well at this point to mention that there are two allied, but separable, ceramic complexes which are associated with this single prolonged southward movement of culture. The first of these was in full swing at about A.D. 1100 and is identified by black-on-white pottery. The second, coming somewhat later, was well established by about A.D. 1250, and is identified by polychrome pottery. The Salado Culture lasted to about A.D. 1450 in the Gila drainage, before it was dissipated, and general Pueblo characters are very marked in both pottery and house types. Other features which may be considered more or less diagnostic are fine stone and shell working, inhumation, and possibly much use of basketry and the manufacture of large cotton blankets.

On the accompanying map no effort has been made to separate the early from the late ceramic complexes, so that both are included. As a result a comparatively large area is covered by this total culture in the Gila and Salt River drainages. When it is remembered that a period of at least three hundred and fifty years is represented the extent of the area becomes more understandable. From this map it is apparent that

the Salado Culture primarily occupied the mountain section of the state, but spread both west and south into the desert to include at least sporadically the entire Upper Gila area. This culture might be very easily subdivided into several smaller divisions, on the basis of temporal

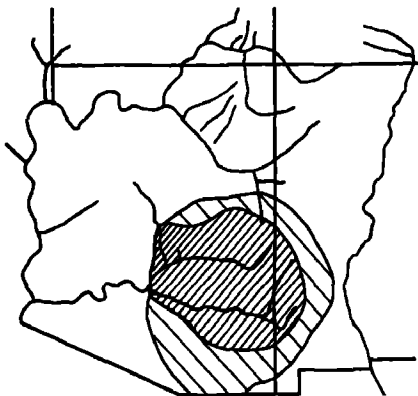


FIG. 145. Area occupied by both the black-on-white and polychrome phases of the Salado Culture. The area of greatest concentration lies in the Gila and Salt drainage above the juncture of the two rivers. The black-on-white phase was largely confined to the mountains, whereas the polychrome phase spread farther west. The area of maximum expansion is not much greater. The source of the culture is in the headwaters of the Little Colorado River.

and areal distinctions, as Gladwin has already indicated. Certainly the desert and main mountain sections are distinguishable, as well as an early and late phase of both, and the mountain section could be divided into a northern, central, and southeastern portion. However, the lack of detailed published information makes such minute divisions impracticable.

By now it has become apparent that two of the most important periods in Southwestern archaeology are A.D. 1100 and 1300. Both these dates mark radical cultural upsets in the plateau and desert areas and are strongly reflected in the history of Salado Culture. It has already been pointed out that

its beginning was in the Little Colorado area, and suggested that it started a serious expansion southward by about A.D. 1100. The next period of expansion was most marked at about A.D. 1300, when the abandonment of the San Juan gave a strong impetus to this southward movement. Although it was a vigorous culture it appears to have mixed quietly with both Hohokam and Mogollon, which had passed their peak by this time and were ready for the acceptance of new ideas and perhaps new blood.

Several pottery types are characteristic of the Salado Culture. Tularosa Black-on-white as a distinctive type has already been described. As Gladwin has pointed out, and as has been suggested here, it is probably subdivisible into Puerco and Roosevelt, distinctive but definitely associated types. Gila Red is very characteristic, as are Pinto, Gila, and

Tonto Polychromes. Upper Gila Corrugated is most commonly found associated with the black-on-white types in the headwaters of the Gila and Salt Rivers, and Salado Corrugated with the Polychrome sites. Several other types of pottery also occur in this complex, but as they are now felt to be of less importance they will not be discussed.

Roosevelt Black-on-white differs from Tularosa Black-on-white not in general arrangement of design or forms but in several easily overlooked particulars.

Bowls are much smaller and tend to be relatively thicker walled, and they have a very small horizontal strap handle or perforated



FIG. 146. Forms of Roosevelt Black-on-white pottery. Duck canteens are common, and bowls are small and with horizontal handles. Jars do not have animal handles as is common in the Tularosa type, but the designs are similar.

lug on one side. See Fig. 146. Pitcher handles tend to be made of straps instead of animal figurines or animal heads. Duck bowls, such as the right-hand figure, are quite common. The base of jars or pitchers is marked by a horizontal black band terminating the design, which viewed from the bottom appears like a circle. Tularosa is the same, but the bottom line, terminating the design, when viewed from below commonly suggests a roughly formed five-sided star.

One of the most interesting pottery types associated with this complex is Gila Red. This type has been dated from about A.D. 1200 to 1400, although in the Snaketown report Haury lists it as belonging to the Soho Phase. This phase is indicated as beginning at about A.D. 1100 and thus would suggest a possibly earlier beginning date. Work now being done at Winona Village, just east of Flagstaff, has shown that Sunset Red and similar types had an origin slightly earlier than A.D. 1100. As these types are definitely related to Gila Red, as has been pointed out by Gladwin and others, it is quite possible that Gila Red had its origin in the Flagstaff area and spread south, changing slightly as it went as a result of different techniques and materials. Strong Hohokam influence is apparent at Winona Village, and it is possible, of course, that the concept of a red type might have been introduced from the south, developed here, and again spread south.

Gila Red is made by the paddle and anvil process, and fired in an oxidizing atmosphere. The paste is red to buff or gray, and contains water-

worn sand temper with some mica. The outside is slipped with a bright red slip, sometimes shading to an orange tint, which is marked with polishing streaks. These streaks are often so prominent that the type has been referred to as "onion skin." They begin either at one focus, usually the center of the base, and extend outward to the rim, or pass across the bottom of the vessel from two foci on the rim. Forms are very varied,

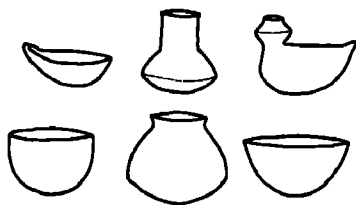


FIG. 147. Forms of Gila Red pottery. The scoop is a typical form, as is the high-necked jar. The Gila shoulder is a common form in jars. Effigy canteens in bird or other life forms are typical. Bowls are both hemispherical and relatively shallow. This type characteristically has the "onion-skin" surface finish caused by smoothing striations.

including bowls, plates, jars, ladles, and a great variety of eccentric and life forms. Jars characteristically have a Gila shoulder, sometimes very marked, many of them have a high cylindrical neck, as in the central upper example in Fig. 147. Bowls are of both shallow and deep hemispherical shape, but occasionally are rectangular or oval. One of the most characteristic forms is the scoop.

In the Upper Gila or mountain area, a very fine type of corrugated pottery was being made, probably sometime between about A.D. 1100 and 1200. It has commonly been referred to as Upper Gila Corrugated. Its origin appears to have been associated most directly with Mogollon development, and so should not properly be included here, but by now a strong Pueblo influence, through the Salado Culture, was being felt by the Mogollon, and this type was most likely a result of this mixture. The pottery was made by coiling and was fired in an oxidizing atmosphere. The paste is fine and hard, gray to brown in color, and contains fine temper, mostly sand. The walls are exceptionally thin for corrugated pottery. Forms are bowls and jars with rare small pitchers. Bowls are smudged black on the interiors and often highly burnished. The exterior has exceptionally narrow and even corrugations, commonly

covering the entire surface, but sometimes confined to the neck portion. In large jars indentations cover the entire surface, but in bowls they sometimes form only a portion of the corrugations, thus creating a design. See the lower left illustration in the accompanying figure. There is a tendency to shoulders in jars and flattened bases in bowls, as well as large mouths on jars and pitchers. Bowls are deep, even in relation to their large size. This type probably represents about the finest corrugated pottery.

Somewhere in the upper Little Colorado, or White Mountain area, polychrome pottery developed and spread southward. As soon as it had moved into the Gila and Salt River drainages it took on a distinctive character of its own.

The first of these southern types is Pinto Polychrome, which has generally been roughly dated as between about A.D. 1150 and 1250. Vessels are fired in an oxidizing atmosphere.

The paste is medium to coarse and red to gray in color, with sand

temper containing some mica. It is on the whole crumbly and relatively poor. The only forms are bowls, the exterior of which is covered with a reddish slip. The interior has a thin white-to-cream slip, upon which the dull black design was applied. There is no decoration on the exterior. Designs are often very suggestive of Tularosa Black-on-white, and contain balanced solid and hatched elements. The most distinctive feature of this type is that the design extends clear to the rim, without a separating white space or framing black line.

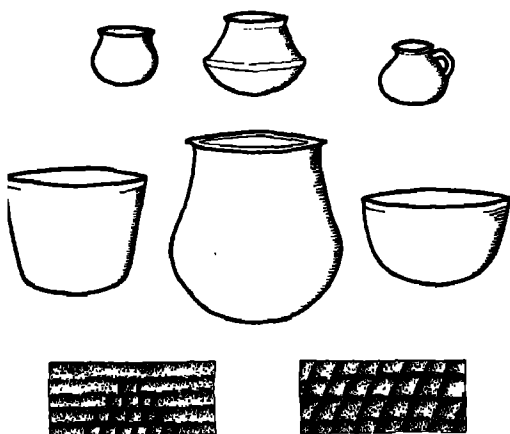


FIG. 148. Forms and styles of corrugation of Upper Gila Corrugated pottery. The lower left figure shows partial indentations to form designs on the outside of the bowls. The lower right is the type of over-all indented corrugated found on large jars such as that in the lower center. There is a tendency towards shoulders and large mouths in jars and large deep bowls in this type. The interiors of bowls are smudged black and often highly burnished.

The second type in this series is Gila Polychrome. It has been dated at about A.D. 1300, but the range is somewhat uncertain. It is often found associated with the latest type in sites as well as with Pinto Polychrome. In most respects it is like Pinto, but jars and effigies were made as well as bowls, and the design is different. See Fig. 149. Bowls are still the



Several pots found with a burial in the San Carlos section by the Arizona State Museum.
The forms are typically Upper Gila.

most common form. Bowl interiors are slipped white, and have a black design, the most characteristic feature of which is the presence of a broad black line separating the main portion of the design from the rim of the vessel. This line, often referred to as a "life line," is generally broken at one point in its circuit. Jars contain a white slipped background with the same broad upper black line, and a red slip applied above and below the decorated zone. Designs are largely made up of massed black elements, such as tapering triangles or coarse serrations on wide lines.

The third type is Tonto Polychrome, which has been dated as existing in abundance at about A.D. 1400. Certainly it occurred earlier than this date and lasted to about A.D. 1450 over much of the area occupied by the Salado Culture. In such characters as paste, firing, and form it is like both Pinto and Gila Polychrome. The forms are bowls, jars, vases, and some eccentric shapes. Some of these vessels, particularly bowls and jars, are exceptionally large. In this type the white slip of the background has a black and red design so arranged that the red appears to be the

base although it was applied last. See accompanying figure. Bowls have all three colors on both the inside and outside. The black designs in most characters are similar to those of Gila Polychrome.

All these three types were made in varied and interesting forms, many of which are similar to those of Gila Red. Some of the vessels are carefully shaped, but others are markedly irregular. Bowls are both hemispherical and with outflaring rims. Vases with very tall slender necks and globular bodies are common. Jars are, on the whole, relatively small, although some unusually large examples have been found. Life forms, such as squash or duck canteens, are not uncommon, and such peculiar flat-bottomed jars as that shown in the upper right corner of the figure occur.

One other common type of pottery remains to be identified. This is Salado Corrugated, which has been roughly dated as existing between about A.D. 1150 and 1250. It seems to have accompanied the earlier of the polychrome types. It was fired in an oxidizing atmosphere and is made of a medium to coarse red or brown

paste, with sand temper and some mica. The forms are bowls, jars, and eccentrics. The outside of both bowls and jars is corrugated with indented oblique marks. The corrugations are often mostly obliterated by smoothing. The outside of vessels is red to a purplish color, and the interior is always smudged black. Occasionally a chalky white design was applied to the outside, in narrow lines with pendant dots or triangles. The paste is so poor and friable that this is a relatively poor type of corrugated pottery, especially in comparison with the fine Upper Gila Corrugated already mentioned.

Salado house types are one of the typical Pueblo traits carried into

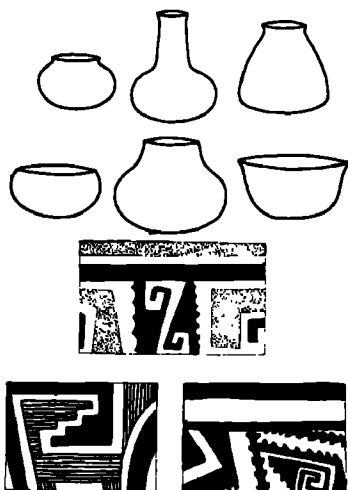


FIG. 149. Forms and designs of polychrome types from the Gila. The lower left design is found on Pinto Polychrome, the earliest of the group, and runs without a break to the rim. It suggests a Tularosa style. The lower right is Gila Polychrome and has a broad black band above the design and below the rim. The upper design is Tonto Polychrome in which red forms part of the background. Typical forms are shown.

this southern area. Along the Gila proper, and as far south and west as Tucson, some of the earlier black-on-white sites seem to have had single-room houses which were either very shallow or rectangular surface structures. These were sometimes grouped into small masses of rooms somewhat like unit type houses. Though these houses were contiguous they in no case formed large massed pueblos. Farther east and north small



One of the many ruined compound sites in the Roosevelt Lake section. Walls are roughly laid up of boulders and adobe. They may be assigned to Salado Culture.

true pueblos were made and occupied at this time. Masonry consisted of both sandstone and boulders set into clay mortar, so that most of the walls were comparatively massive. Few of these sites are large, and to the writer's knowledge no definite kivas have been found associated with them. Farther north they became more distinctly pueblos, and in the Little Colorado area they have kivas.

By the time the polychrome invasion had gotten well under way larger, more massive pueblo sites were being built. Figure 150 shows in rough outline one such boulder masonry pueblo site near Roosevelt Lake. The walls are of river boulders set in an abundance of clay. The main portion of the site is constructed of massed rooms, mostly one story high but some of two or more stories. A long narrow court is apparent at the north end of this site.

By the time Salado influence had spread into the Middle Gila section proper the pueblo had become well established to the north and east. As no stones suitable for construction of walls were available in the sand deserts, adobe clay was used for the construction of massive walls. The general architectural arrangement was also modified in the desert country, and here the characteristic type of structure is the compound. A pueblo might be defined as a mass of rooms completely or partly surrounding one or more courts, often with a wall closing the open end or sides. A compound, on the other hand, is a surrounding wall within which scattered clusters of rooms are to be found.

A series of three such compounds on the old Meddler Ranch near Roosevelt Lake is pictured in Fig. 151. Three trash mounds were associated with them. Each of these compounds consisted of a surrounding wall enclosing rooms. As none had been excavated, only such an approximate drawing as that shown could be attempted.

The classic compound site is, of course, Compound A at Casa Grande. The central structure within the compound is four stories high and has walls as much as four feet thick. Many theories have been advanced as to the method of construction of these heavy walls, even the suggestion that movable forms were used for pouring the adobe. However, it is certain that they were made in sections, which were built up of puddled clay with a rounded top and straight sides, and allowed to harden before the next section was added. As Casa Grande is so well known through many written descriptions, there is no need for further details.

The history of the Salado Culture may thus be identified as two

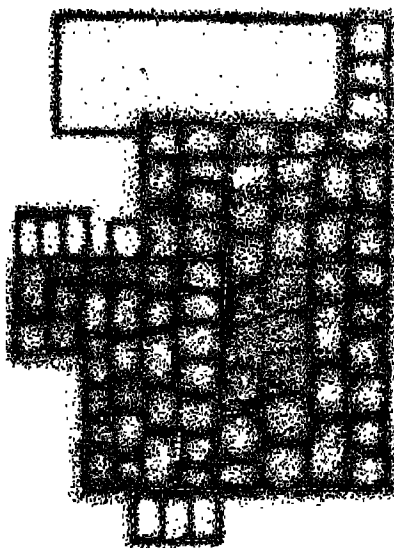


FIG. 150. Approximate plan of a pueblo-type site in the Roosevelt Lake area. As this is made from field notes it is not absolutely accurate. Essential features are the mass of rooms and the court. Masonry is of water-worn river boulders set into abundant clay mortar.

southward pushes of Pueblo influence. The first of these had Roosevelt and Tularosa Black-on-white pottery and occupied either small houses or small unit-type house groups. To the east, Upper Gila Corrugated pottery was added to the ceramic complex, and was probably derived from a combination of Mogollon and Salado Cultures. At about this time, or slightly later, the first of the polychrome types of pottery appeared,

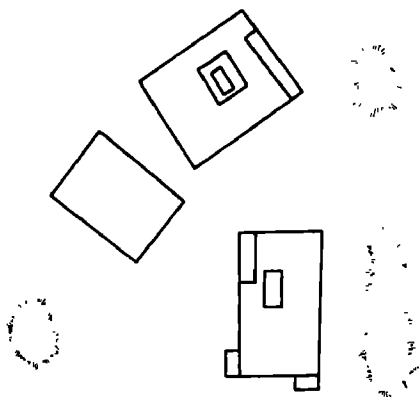


FIG. 151. Rough sketch plan from field notes of a site consisting of three compounds. This site is on the old Meddler Ranch in the Roosevelt Lake section. This type of structure is typical of the Salado sites in the Middle Gila area, and is probably best represented by Compound A at Casa Grande.

in association with Gila Red and Salado Corrugated. The house type was larger and distinctly Puebloan in the eastern or mountain section, but to the west, in the Gila and Salt drainages proper, was of the adobe compound type. At Roosevelt, transitions between these two house types may be seen. The polychrome types, in the order of their occurrence, are Pinto Polychrome, Gila Polychrome, and Tonto Polychrome.

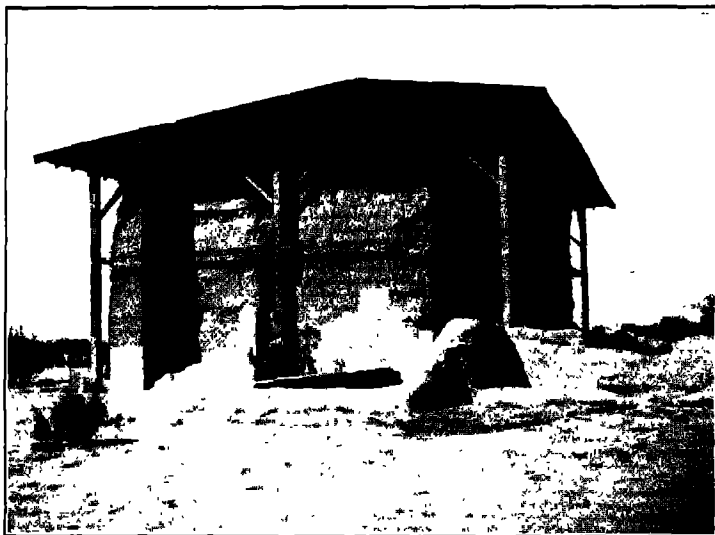
The physical type is essentially Pueblo, with round deformed heads and comparatively light-boned frames. Burials are either semi-flexed or straight, and were often placed within or beneath

trash mounds or in houses. In some sections and periods, quantities of grave goods were interred with the bodies.

Metates are of the high-sided trough shape, and manos are rectangular. The stone axe is uniformly of the three-quarter-groove type and is usually well made. This is undoubtedly a trait taken over from the Hohokam people with whom the Saladoans were in contact. Mauls are relatively abundant, and are of the full-grooved type, at least to the east. Points are triangular and similar to those of the plateau and desert at this time. For examples see Fig. 118. Some are long and slender with a tendency to serrations; others have straight smooth sides and lateral notches.

Although most of the excavated sites have been in the open where perishable material is seldom found it is quite likely that basketry was

an important product of this culture group. At the cliff dwellings in the Sierra Anchas, Haury found an unusual use made of all sorts of basketry. Here many wicker baskets of extraordinary size were made for storage, and there were a great variety of smaller baskets. In many of the open



The big house in compound A at Casa Grande. As may be seen to the left the walls are as much as five feet thick. The method of construction by the addition of blocks is clearly shown in this picture.

sites traces of basketry have been found, and to the north, in some sites of about this age and perhaps this culture, painted basketry. A great deal of matting was also made as a variety of floor mats of all sorts indicates. Probably cotton cloth was well developed and in wide use by these people, for Haury also reports the finding of very large cotton fabrics in the Sierra Anchas.

Knowledge regarding hunting implements is not very exact, although the bow and arrow was certainly common. From this it is quite likely that other Pueblo hunting implements accompanied the complex south. Foods were also in general similar to those of the Pueblo people to the north, although irrigation was resorted to in the desert section.

One of the most outstanding characters of this group was the production of superior ornaments. Great quantities of very fine and excellently

made stone beads are found in every site of this culture. Many of these beads are practically microscopic and are drilled and ground with precision. Shell was also worked in quantity, probably as an influence from the Hohokam. Cut-out shell pendants are relatively common, but the carving of shell in high relief appears to have been absent. Plain shell bracelets or pendants are very abundant, many often being found in one grave. Pendants, some with inlays, are also characteristic. See Fig. 152.

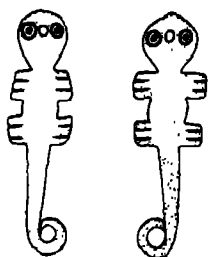


FIG. 152. Two cut-out shell pendants of the Salado Culture which were found and reported by Nesbitt at the Starkweather site.

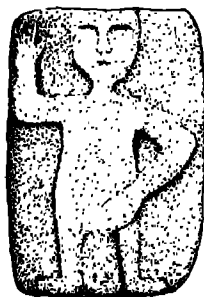


FIG. 153. Stone carving found at Starkweather Ruin by Nesbitt. It is such examples of carving in stone which have led to the feeling that stone work may be a culture trait of this group.

These people were good workers in stone as well as shell carvers and makers of beads. Figure 153 shows a human figure carved in relief on a stone slab, which was found by Nesbitt in the Starkweather ruin. It is only an average example of such work. The writer has also seen several very fine stone dishes which may be ascribed to this culture. One such was made of a light green, fine-grained stone and was carved in perfect proportions. It was a long, shallow, rectangular vessel with slight knobs at the corners as though for grasping in the hands. Such fine objects were probably somehow connected with ceremonial practices, for they are much too ornate for ordinary use.

One other character which may be a trait of this culture is the presence in several of these sites, particularly those to the north and east, of small clay animal figurines. These are usually crudely modeled and are small enough to suggest that they may have been made as toys for children. Miniature clay vessels are also found in such sites.

Bone and horn, so far as the writer is aware, are very similar to those of the Pueblo Culture. Awls are relatively common and do not appear to show any distinctive variations from those types already described.

The only objects, in the absence of kivas, which might be considered ceremonial are the stone bowls mentioned. It is quite likely that certain reed "cigarettes" which are wrapped with small strips of cotton cloth are of this culture, for they are found in caves in the desert as well as at Casa Grande Ruin.

In summary, several characteristics of this culture are distinctive. Probably the most outstanding traits are the polychrome pottery types, compounds, fine stone and shell work, and possibly basketry, matting, and cloth.

Other features are not greatly different from those of the Pueblo Culture. Salado Culture had two sources. The earlier black-on-white pottery and general culture came from the Puerco-Little Colorado area, and appears to have been primarily associated with Mogollon

Culture to the east. The second influence is marked by polychrome pottery. Its inception was in the mountain area, in or just south of the upper reaches of the Little Colorado River drainage, and seems to have been primarily a Hohokam associate. Gila Red pottery may have originated near Flagstaff, as shown by the recent excavations at Winona Village, where many characters show Salado tendencies. Other sites to the east, as reported by Hough, also have some Salado traits and complexes, some even having Gila Polychrome pottery types. The Salado Culture undoubtedly received much influence from the Mogollon Culture, and in return gave much to the Mogollon. After about A.D. 1450 the Salado was gone from the Gila and Salt River valleys proper, and probably moved eastward and south to combine with Mogollon derivatives.

In this discussion the early black-on-white and the later polychrome manifestations have been combined as both being Salado. Some individuals would not be inclined to group them in this manner, but it is the feeling of the writer that all direct Pueblo influence in the Gila and Salt drainage should be so considered.

Although the Mimbres and Casas Grandes Cultures lie on the periphery of the Southwest, and neither of them had a very profound effect

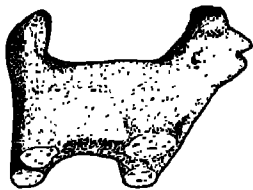
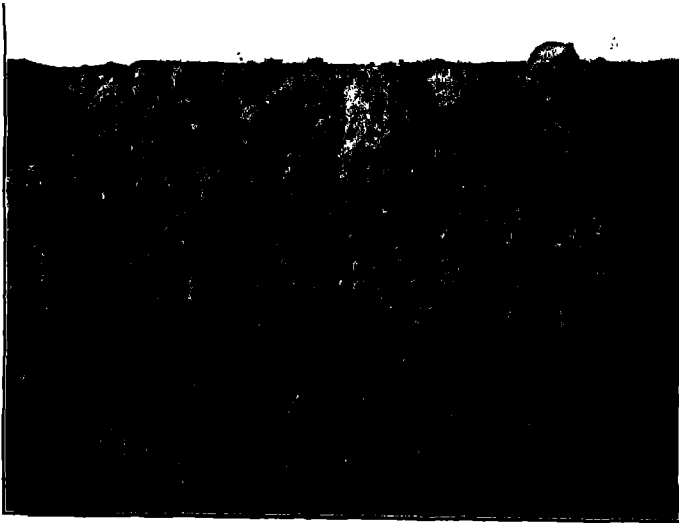


FIG. 154. Small clay animal figurine from the Stark-weather site. It is quite likely that such figurines are typical of the Salado Culture.

on its cultural development, some mention should be made of them. Mimbres is one of the most distinctive cultures found in the Southwest, largely because of the remarkable designs on its pottery. Two styles of decoration are commonly found; one is purely geometric and strongly suggestive of some of the Tularosa styles, the other is highly conventionalized life forms. It is the life forms which have so captivated popular fancy. In every specimen the execution is remarkably exact and well done; in fact, the drawing is far superior to that of any other period in the entire Southwest. This pottery was primarily fired in a reducing



Detail of a compound wall in the Gila area. These heavy adobe walls were built up in sections as is clearly shown in this illustration. One such block near the center of the picture is outlined by weathering.

atmosphere but was occasionally oxidized, when the usual black-on-white designs became red or brown on cream. It is all surprisingly attractive. As this culture is widely described, and many of the finest of the pottery types are pictured, it will not be further discussed here, except to suggest that it was probably derived from an early Salado and Mogollon combination.

Casas Grandes appears to have developed from this, and to have had its rise and development farther to the south in Chihuahua, Mexico. The type site of Casas Grandes is a most impressive village, which was

constructed on the general Pueblo plan. Here a fine polychrome pottery was developed, which had a buff background and black and red decorations. The most remarkable feature of this type was the production of human effigy vessels, somewhat suggestive of those made far to the south. This culture has also been variously reported in some detail.

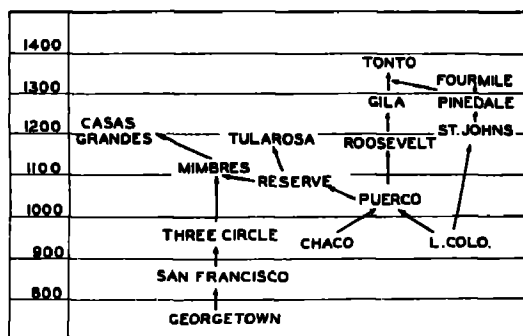


FIG. 155. Chart which roughly represents the various relationships of the cultures and components discussed in this chapter. In this chart phases and pottery types are both shown in an effort best to indicate these relationships. The numbers to the left represent dates in terms of our own calendar. This chart may be considered a supplement to and fuller explanation of Fig. 27.

The accompanying diagram, Fig. 155, is an attempt to show the relationship of the various cultures and phases which have just been discussed. From this chart it is apparent that Mimbres is a direct development from the Mogollon series with some influences from the Tularosa and Hohokam. The Tularosa in turn is derived from Chaco and Little Colorado influences which gave rise to the intermediate Puerco pottery series. From the Puerco, Roosevelt Black-on-white pottery developed, and later combined with the Gila and Tonto Polychrome series. This development was aided by the Pinedale Polychrome, and probably later by the Fourmile Polychrome groups.

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Chapter XXIII

THE PATAYAN CULTURE

As early as 1930, in surveying the western range of the Hohokam, H. S. Gladwin recognized the sites found along the Colorado River as different from those farther east in the Gila area. Near the Colorado River he found pottery types, such as Cerbat Brown, which are now being placed in Tizon Brown ware. Associated with them, though less striking, were types known to be Hohokam, and a sprinkling of Pueblo sherds. Sites were represented by mounds, rock shelters, and sherd areas. All this was based on surface surveys, for no actual excavation has been accomplished in this part of Arizona. By 1934 Gladwin had a clearer appreciation of this complex and called it Yuman. However, as Yuman refers to a living Indian tribe the name has been changed to Patayan, meaning "old people" in the Walapai Indian language, a name which has no direct reference to living Indians.

Until 1938 from the mouth of the Colorado River to the Grand Canyon no more sites had been reported and none had been systematically excavated. In that year a survey of the area lying south of the Grand Canyon and west from the San Francisco Peaks was undertaken by the Museum of Northern Arizona, which located more than a hundred sites. This was followed by excavation just north of Williams. Although the material culture has not been completely studied it is possible to arrive at some idea of what constitutes the northeastern branch of the Patayan Culture. This northeastern branch has been named Cohonina. No actual tree-ring dates have been secured, but dated pottery from the Pueblo area makes it possible to suggest that though some of these sites antedated A.D. 700 most of them were occupied between about A.D. 900 and 1100. It is also conceivable that some may have been occupied much later.

On the accompanying map the Patayan Culture has been outlined as three separate areas. That to the northeast is the Cohonina Branch, to the west along the Colorado River is the Cerbat Branch, and south of

the Cohonina Branch lies the Prescott Branch. All over the Cohonina area gray pottery is found, which, when it is decorated, has either a black or a red paint. The most widespread pottery is a type with a gray paste and a fugitive red wash over the outside of the vessel. The forms are usually large jars or bowls. As the archaeology of this area is so in-

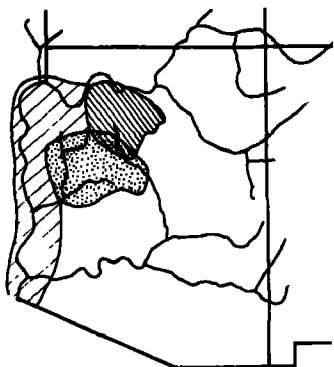


FIG. 156. Generalized outline map of the area occupied by the Patayan Culture. The hatched areas are Patayan; the dotted area is Prescott. The fine hatched area is the Cohonina Branch of the Patayan Culture. Map prepared with assistance of H. S. Colton.

completely known, further study will probably alter the outlines of the present map considerably and will certainly establish many additional phases in so large a section. Even now within the Cohonina Branch indications of several phases are apparent.

As the Cohonina is best, even though incompletely understood, the discussion from this point on will be largely confined to it. The area occupied by the Cohonina Branch extends roughly from the Little Colorado River on the east to the Big Sandy on the west, and from the Grand Canyon on the north to the Bradshaw Mountains on the south. On the Coconino Plateau, south of the Grand Canyon, the Cohonina Branch enjoyed the longest occupation. Except for Pueblo pottery types traded there,

all are of San Francisco Mountain Gray ware. The most common type is Deadmans Fugitive Red, and Deadmans Gray is second. Both typically occur in the form of jars. The third, but much the rarest type, is Deadmans Black-on-gray. Of these Deadmans Fugitive Red is by far the most widespread and most diagnostic.

Deadmans Gray was made by the paddle and anvil process and fired in a well-controlled reducing atmosphere. The paste is gray and contains an abundance of fine sand and mica, or micalike fragments, often visible on the surface. The surfaces are compacted but not slipped, so that the mica may show through. The most common forms are jars and deep hemispherical bowls, while pitchers are very rare.

Deadmans Fugitive Red is similar to Deadmans Gray in most characters. The surface is sometimes not so well smoothed and shows wiping or scraping marks made in the damp clay. A heavy red paint was applied to the body of the vessel up to the neck and again along the edge

of the rim. The paint is fugitive so that it typically rubs off easily. The forms are bowls and large jars, the jars being by far the most common.

Deadmans Black-on-gray is like both of the above except that decoration in a thin dull black paint is found on bowl interiors and jar exteriors. Designs are crudely or carelessly applied as compared to the better Pueblo pottery types. They consist of fine or narrow lines, often in parallel series, and small solid triangles many times with pendant dots or short fringelike lines. The decoration characteristically occurs in bands about the interior of bows. See the design illustrated in Fig. 157.

The work done by the Museum of Northern Arizona in the immediate vicinity of the San Francisco Mountains uncovered several pithouses the pottery of which belongs to the Cohonina Branch. By reviewing the cultural material found in these sites it is possible to enlarge the lists of traits known from the work done near Williams. As a result many of the characters mentioned in the following lists have been taken from this source. Much more detailed work in the future may show that some few are not truly Cohonina but must be ascribed to other influences. However, at the present time, since many of these added traits are such that they might well be expected in most Southwestern cultures, it is felt worthwhile to include them.

Houses of the Cohonina Branch appear to have been largely of two types. The first was a surface structure constructed by simply clearing off a level space on the surface of the ground and building a light framework above it. The features of most of the houses of this type which have been dug are now gone, so that it is impossible to say more than that there were four main and several supplementary posts and that the sides and roof were of perishable material. The second architectural type is a large rectangular surface masonry structure which appears to have been a fort. Pithouses have also been found in this section but it is most likely that they are a result of outside influences and not a true Cohonina character. The most typical house is certainly the small near-surface dwelling with a perishable superstructure.

There is no information about burials except for one flexed intrusive

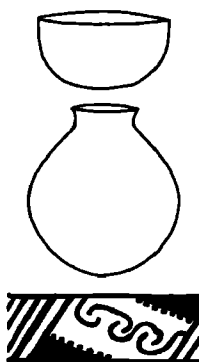


FIG. 157. Common pottery forms of San Francisco Mountain Gray Ware. The central figure is a typical Deadmans Fugitive Red form. The design is a true Deadmans Black-on-gray style.

burial found in a fort. As this is intrusive and as it was not accompanied by any pottery or other offerings it is impossible to determine its date or cultural association. At one site which showed many characters of this culture, cremations in which the bones were not gathered up and later buried were found. As this is a type of cremation now in use by some of the Colorado River tribes it is possible that the lack of burials of these people may be accounted for by the general use of such cremations.

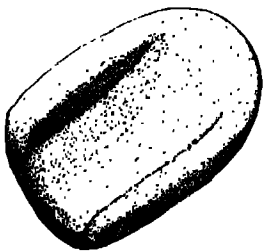


FIG. 158. The Cohonina metate. It is scoop shaped and deep but has a flattened area at one end.

Metates are one of the few distinctive traits which are now known. They are of a rather deep scoop type open at only one end but with a raised flat platform at the other. See Fig. 158. Probably the closest similarity in the Southwest is found with the metates of the Mogollon Culture which are pictured in Fig. 72. Associated with this metate are rectangular block manos of the two-hand type. Both metates and manos are typically made of vesicular basalt.

Hammer stones and scrapers are very abundant in sites of this culture, which is one of the characters that has led to the belief that it was only partly sedentary. Axes are rare in the Cohonina area, and only five are now known from northwestern Arizona. All are of the three-quarter-grooved variety and were probably traded north by the Hohokam people.

A second characteristic Cohonina feature is a distinctive point type. These points, which have been termed the "Cohonina type," are slender and have serrated edges but no notches. See Fig. 159. They are made of obsidian, are carefully retouched, and often have a definitely ridged back. The base is square or slightly rounded, and the greatest width is usually above the base. As the largest of the points pictured is just forty-seven millimeters long, the average is relatively small. From the size and shape they must certainly have been used as arrow points, and from their relative abundance it may be assumed that these people were hunters. Reed arrows with hardwood foreshafts have been found in a cave in which most of the other associated culture traits were of this branch.

Evidences of fabrics made of fibers other than cotton have been found,

although the nature of most of the objects has not been determined. Both twilled basketry and coiled baskets of the two-rod-and-bundle variety are known from the Flagstaff area and certainly may be expected as widespread features of this group.

Ornaments appear to have been quite rare. Shell in any form was not abundantly used throughout any of the Patayan area, and only two circular stone beads were found in the work at the sites just north of Williams. In the Flagstaff area tubular clay pipes have been found.

Bone awls are abundant but in no way distinctive.

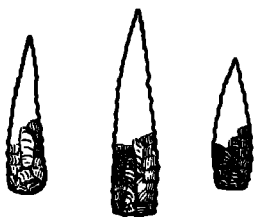


FIG. 159. Cohonina points. The central point is forty-seven millimeters long. Characteristic features are serrations, no notches, and the slender shape. These points are often wider above the base than at the base.



FIG. 160. Designs of typical Verde Black-on-gray pottery, after Gladwin. Features are the broad crudely drawn lines, overrun lines, and triangular or chevron forms.

Another feature which is indicated by the work around the San Francisco Mountains is the use of corn, beans, and squash. The Hopi type of straight digging stick was employed in weeding and cultivating as well as flat stone hoes. Dogs, but no turkeys, were domesticated.

Pottery types found farther west in the Cerbat Branch along the Colorado River proper, although not described in detail in literature, are different from the San Francisco Gray ware types. They were made by the paddle and anvil process but had on the whole coarser temper and were not so well controlled in firing atmospheres. Many of these sherds are quite red and thus were fired, at least in part, in an oxidizing atmosphere. This is a marked distinction, for such types as Deadmans Black-on-gray were fired in a very well-controlled reducing atmosphere. The people of the Cerbat Branch used no masonry, and it is believed that they lived in brush shelters.

On the map a third area has been indicated and called the Prescott Branch. A very distinctive type of pottery, Verde Black-on-gray, was

made here. It was manufactured by the paddle and anvil process and was also fired in a poorly controlled atmosphere so that some sherds are pure gray and others an orange. In many specimens the interior of bowls are gray while the outside is oxidized to a red. The paste is gray to brown, and the temper consists of very coarse angular opaque fragments, some sand, and often conspicuous amounts of mica. The mica is almost always obvious on the surface. The paste is crumbly and friable, and on the whole poor. Surfaces are smoothed and compacted but not polished or slipped. Forms are bowls and jars. Decoration is in a carbon black paint on bowl interiors and the interiors of jar necks, but not characteristically on the exteriors of jars. Elements are wide lines in open triangles or chevrons, and occasional solid masses. The design is invariably poorly and carelessly applied, often showing accidental spots or overrun lines. See fragments of design illustrated in Fig. 160.

The proper placing of the culture found in the Prescott area is still a highly debatable subject. Ceramically the culture of this area shows characters similar to those of the Patayan Culture but in some features it more nearly resembles Hohokam, and in others Salado. Sites which have been excavated around Prescott show very strong Pueblo trade, as well as strong Hohokam and even Mogollon characters. Much more careful and full work is required on all these groups before it can definitely be included in or excluded from the Patayan Culture.

Even at this stage it is possible to suggest certain characteristics which appear to be features of the general Patayan Culture. The type of life appears to have been semi-sedentary, with a good deal of wild plant gathering and hunting, but also some agriculture. Each of the three areas have a widespread, and diagnostic pottery type. For the Cohonina Branch this is Deadmans Fugitive red. For the Cerbat Branch it is Cerbat Brown. For the Prescott Branch it is Verde Black-on-gray. All this pottery was made by the paddle and anvil process, although some scraping was employed in finishing, and it was fired in either a controlled reducing atmosphere or an uncontrolled atmosphere. Surface huts constructed of perishable material were characteristic, and some large surface masonry structures called " forts " were made. Axes are so rare as to be considered practically absent over most of the area, those found probably having been traded. The only metates definitely known are distinctive, with an apron or flat bench at one end and open at the other. The Cohonina type of point is typical of at least the Cohonina area. Ornaments, particularly those made of shell, are rare.

From this it is obvious that much more work is required before any clear idea of the Patayan Culture may be had. In all sections of the area a pottery with a gray paste is typical, which may be carefully fired in a reducing atmosphere or casually oxidized to a red or brown with gray patches. In those vessels which are decorated the most common type of paint is a dull black although along the Colorado River red paint was used. Individual surface houses appear to have been the most common type of structure. Without question this culture is different from that of other areas, but what it was derived from, and what it is most closely related to, are still highly debatable. The writer is inclined to feel that it probably was derived from the Hohokam Culture at a very early date and as a result of isolation along the Colorado River. It may, however, prove to be much more basic to the history of the Southwest than is now felt.

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Chapter XXIV

THE RIO GRANDE

The preceding portions of this book have been concerned with the archaeology of the Southwest other than that of the Rio Grande valley in New Mexico, so that this subject should now be briefly discussed. It is the understanding of the writer that a comprehensive report on the archaeology of the Rio Grande valley, as based on tree-ring dating, is now being written by Mr. W. S. Stallings, Jr. When this is available it will certainly enlarge upon subjects which can be only mentioned here.

In a previous chapter finds indicating a considerable antiquity for man in this portion of the Southwest have been reviewed and summarized. These consist of evidences of human activity found associated with the remains of extinct animals, in all a considerable series. Often associated with such finds, and widely scattered throughout the valley, evidences of a Basket Makerlike culture have been noted as well. In many characters these suggest San Juan Basket Maker, and in others the basic type of Basket Maker material reported from the Big Bend country of Texas. Several have already been mentioned or discussed, such as the finds reported by E. B. Renaud from northeastern New Mexico, and to this list may be added the more recently reported work of H. P. Mera in southeastern New Mexico, which will be discussed in some detail later. None of these finds, however, exhibit the typical full character of the Basket Maker II Stage of the immediate San Juan area. Throughout the northern part of the state there are evidences of a pre-pottery stage of culture, but as they have not been fully reported they are only noted here. Those previously discussed in detail have been found throughout the Rio Grande valley proper south almost to El Paso.

In previous chapters cultures which bear on the prehistory of this area have been characterized. These are, probably about in the order of importance of their influence, the Basket Maker Culture of the eastern San Juan, the Basket Maker and Pueblo Cultures of the Puerco Chaco

Canyon and Mesa Verde areas, Mogollon Culture, the Salado Culture as shown particularly by Tularosa, the Pueblo Culture of the Zuñi area, and the Mimbres. All these have in greater or lesser part contributed to this archaeological history, and have probably in turn received much influence from it. Of these the Mimbres has been the least thoroughly discussed, although it had considerable influence on the development of the southwestern Rio Grande area. There is also a good deal of evidence that culture influence flowed rather freely between Arizona and New Mexico through the mountain section along the state borders, an area which is thus exceedingly important and which is now rather poorly and incompletely known. This is particularly true of the ceramic series, especially so of those basic brown and corrugated types which appear to have originated in this area.

For convenience in discussion the valley may most profitably be divided into a northern and southern province by drawing a line east and west just south of Albuquerque. Although these are not culturally distinct, and no sharp boundary actually existed, the total cultures of the north as opposed to those of the south have enjoyed a different history. In a general manner it is possible to state that the north received stronger Pueblo influence than the south, while the south shows a series of basic brown pottery types which may be connected with Mogollon development.

The first basic cultural invasion is of a general Basket Maker III Stage and is found only in the northern section. Those groups of this culture which have been dug and reported, and lie to the northeast, have already been discussed. Such a site is Shabike'schee Village, and those of similar culture levels in the Chaco Canyon and Mesa Verde areas.

This represents the base of culture derived at this early time, apparently coming from an area which might be called the Chaco-Puerco section. This region would stretch through the Chaco Canyon area and south to include the Puerco River on the west, the center lying somewhere south of Chaco Canyon, probably nearer the Puerco. Generalized pottery types have been described as Lino Gray and Lino Black-on-gray, but neither of these types in true form is found abundantly east of the Arizona line. The most common type of this period is Whitemound Black-on-white, which is similar to Lino in temper but white instead of gray in base color and with distinctive designs and paint.

Such sites are found widespread throughout the northern Rio Grande and as far flung in northeastern New Mexico as the eastern edge of the

Rocky Mountains or the upper plains. Although the most common pottery type of this time throughout all northern New Mexico is Whitemound, and although small quantities of Lino do appear in the state, in the extreme upper part of the San Juan two distinctive local pottery types are found. These are Rosa Smoothed and Rosa Black-on-white. They are probably late Basket Maker, or perhaps Pueblo I types, for Mera privately reporting his work in Gobernador Canyon found a few with neck-coil types. Certainly they are later than the typical Lino types found farther west. Houses associated with Rosa Black-on-white pottery are typical four-post pithouses.

All these types were obviously derived either directly or indirectly from the San Juan basic group, though indications now point to a slightly later date than typical San Juan Basket Maker, or perhaps even that of the Chaco-Puerco section. Another black-on-white type, San Marcial Black-on-white, is found farther south in the Rio Grande valley, near San Marcial. Though belonging to this period it evidently is of other cultural affiliations than the San Juan or Chaco-Puerco sections for it occurs on brown-ware sites exclusively. Although it is somehow related to Whitemound Black-on-white the rest of the ceramic complex shows derivations from the basic brown pottery groups to be more fully discussed later. Most of these brown types are plain but include some neck banding such as Alma in the neck-coiled form. In the Rio Grande valley proper houses of this culture seem to have been surface or very shallow structures, for firepits are found just a few inches under the surface. West of the Rio Grande valley pit outlines are known.

From this point on it is possible to divide the culture of the north from that of the south even more clearly, although it must be remembered that each mutually influenced the other to some extent. The southern section seems to have been continually underlain by the basic brown Mogollon-derived ceramic complex already mentioned. In general in the northern Rio Grande the first influence was from the Chaco-Puerco area and culture; later this was followed by definite Mesa Verde influence, a situation comparable to that already noted for northeastern Arizona; and last of all the influence was from the Zuñi section.

After Basket Maker a general Pueblo I cultural expansion from the Chaco-Puerco region filtered into the northern province of the Rio Grande valley. The basic decorated pottery type is Red Mesa Black-on-white, which has been described in several reports and is referred to by Roberts as Chaco I. A second type, Piedra Black-on-white, is confined

to the upper or more eastern portion of the San Juan River valley proper, and did not get actually into the Rio Grande section. As has already been suggested it seems to have developed here from the earlier Rosa pottery types. Associated with this culture are a few black-on-red pottery types. The house was probably constructed of brush covered with adobe, and was located on stream terraces where subsequent agriculture has largely obliterated any traces that might have remained.

Trade pottery from these sites is of some interest in indicating early directions of influence and contacts. One of the most interesting types is a red-on-orange found in the work done by J. O. Brew in southeastern Utah and by Morris in the four corners, and previously discussed. From the south and west came basic brown types, characteristic of southern New Mexico. These latter are of two general classes, the first having a bright red slip both on the interior and exterior, and the second with a red slip on the exterior and the interior smudged black and burnished. All these the writer feels to have been related to Mogollon.

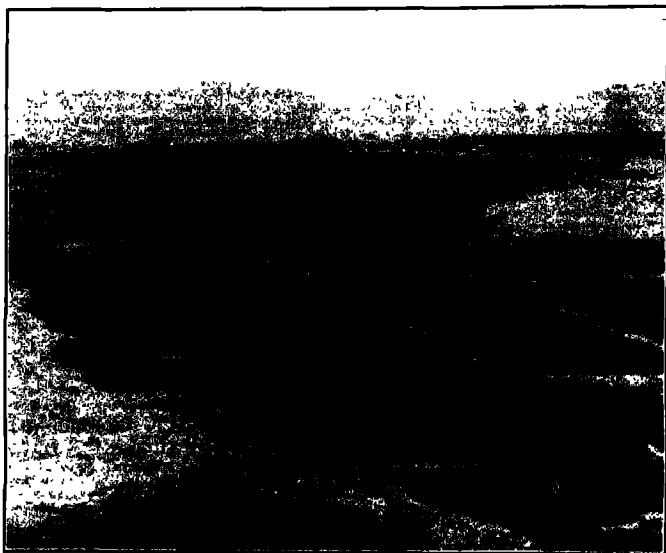
After this development, which seems to have had little direct influence on the Rio Grande, a definite Pueblo expansion took place into the northern area. This was also Chaco derived, but was of a general Pueblo II culture stage. The early northern Rio Grande pottery was very definitely Chacolike, but later local craftsmen made poorer and coarser copies. This expansion skipped the Gobernador and Largo areas, which had a distinctive development of their own, to be discussed later. The Rio Grande pottery types are most easily distinguished from those of Chaco in that they have no slips, a poor slip, or a light wash. The draftsmanship is also much poorer. Kwahe'e Black-on-white is one of these, which has no slip or a very thin wash, and a sherd temper. Taos Black-on-white was much more Chacolike, with a definite slip, but with sand temper instead of sherd temper; this type seems to have enjoyed a very long local survival in the Taos valley region.

The plain types are a good indented corrugated and an elaborated incised plain. The early indented corrugated is the better, but later it became much more carelessly made with flattened coils and in general a much cruder appearance. This sequence was also previously noted for northeastern Arizona.

The trade pottery consisted of such types as Wingate Black-on-red and smudged interior types with brown, sometimes corrugated, exteriors. This ceramic group is from the mountain section to the southwest. There are also a few scattered sherds of a Pueblo III Chaco type which

once more suggest a time lag in the Rio Grande area. In general no Pueblo III Chaco settlements are represented in the Rio Grande so that later influences came from other sources.

One of the most outstanding architectural features of this period in the Rio Grande proper is the lack of coursed stone masonry and the considerable use of adobe in building. One pithouse of this general culture has been dug, but most of the sites are surface structures. Some of these have been located for defense, but many have not.



A large adobe-walled New Mexico pueblo which was excavated by members of the Laboratory of Anthropology staff.

Although this period marked the end of definite and true Chaco influence, except ceramically in the Taos area, a few pure Chaco sites had existed previously from Colorado south to Socorro, and to the east of the main range of the Rockies. After the recession of this widespread Chaco influence the northern and southern portions of the state became even more distinct culturally.

Previous to this time, from the San Juan area, Pueblo influences spread to the country to the east and south, most likely up the valleys of the Largo and Gobernador canyons. It is of interest to note that the Chama River was apparently little used as a migratory route, for Mera reports

that there are only a few sherd areas of Gallina Black-on-white in the extreme upper course, then nothing until a short distance above Abiquiu where typical Rio Grande material, though none earlier than Santa Fe Black-on-white, is found.

The black-on-white pottery appears to have had its source from the sandy Basket Maker III and Pueblo I types. This decorated pottery, and that with neck coils, shows definite Chaco influence. Gallina Black-on-white developed as a local variant here, with a sandy paste containing fine to coarse temper. It was smoothed and sometimes crudely polished but had no true slip. Designs are in a dull bluish gray paint and in quartered or horizontal bands.

Associated with this basic ceramic development was an equally important pottery type which is markedly foreign to the Southwest. Sherds examined by midwestern archaeologists were proclaimed to be definitely related to Woodlands types of pottery from the northeast. All have pointed or conical bottoms and show a great use of filleted rims. The paste is coarse and contains sandy temper, and they were constructed by the paddle and anvil process. This type is most suggestive of later Navaho cook pots and may actually in some manner be connected with the development of these people.

House types appear to be equally distinctive. Pithouses, which have been dated at A.D. 1106, were as much as 25 feet in diameter and seven and a half feet deep. The roof was supported by four posts. A distinctive feature was a low wall, which later became storage bins, that separates the main portion of the room from that in which the ventilator opens. This was broken in the middle by a lower deflector which separated the ventilator from the firepit. The ventilator, deflector, and firepit were thus in a line. There was a bench around the main portion of the room. Circular surface houses with unusually thick and high walls of piled stone were dated as A.D. 1253 to 1264. These were exactly like the pit forms in interior features, except that the wall had now become two series of bins. Later types were definitely rectangular but still with the same features. As the walls of all these structures were extraordinarily high, and they had no doors, they must have been entered by ladders from the roof. Some of the latest of these sites are Pueblolike in general features.

Other characters of this culture are of almost equal interest. Metates consisted of flat sandstone slabs, and manos are of the two-hand variety, some of which had been ground by use to a wedge shape. A distinctive

and peculiar short-bitted axe with two side notches and one top notch is very characteristic. Arrow shaft straighteners are of a distinctive T shape, with two or more notches at the top and polished on the sides of the base of the T. A well-flaked knife blade with lateral notches and a pointed end, which was hafted with a rounded cutting end, was also found in this culture. Elk and deer horn chisels were used, and a short baked clay elbow pipe, with two lugs for support, was a typical feature. The crania are brachycephalic and lambdoidally flattened. In general this culture as now known may be dated as lasting from about the twelfth century to at least the early part of the fourteenth.

From a combination of Gallina and Kwahe'e Black-on-white types Santa Fe Black-on-white pottery developed. This pottery spread down the eastern Puerco to the Rio Grande and then northward to about Santa Fe. Although Gallina Black-on-white was undoubtedly a strong formative source, the associated plain pottery does not have the pointed bottoms described above, but rounded bases of a more Pueblolike character. In the course of its migration it derived some Mesa Verde elements, particularly as regards design, but had no true Mesa Verde base. The paste contains sand, sherds, or a volcanic tufa temper. The surface is polished and a bluish gray color, and the paint is bluish, almost never black. Forms are mostly bowls.

Trade pottery associated with sites of this culture are St. Johns Polychrome, rarely Mesa Verde Black-on-white, and Tularosa Black-on-white. There are also some Upper Gila coiled types, and Mimbres Black-on-white. From this it is possible to date this culture as of the twelfth and thirteenth centuries.

In the early part of the period houses were large units or small pueblos, but later they became still larger compact pueblos. Masonry is either of crude uncoursed rocks or adobe. Metates are of the flat slab type.

From this developed the Biscuit wares of the northern Rio Grande, which have been so named because of their resemblance to China in the preliminary or biscuit stage of manufacture. The first of this series was Wiyo Black-on-white, the paste of which was soft and sandy, and the temper mostly volcanic tuff. The surface is a light gray or sandy color which was decorated in black paint. This was a poorer and more crumbly pottery than the preceding types, and appears to have been intermediate between Santa Fe and the later Biscuit types.

The center of the true Biscuit area is the juncture of the Chama and

Rio Grande Rivers. It had a very restricted range, lying mostly north of Santa Fe, and seems to have had little cultural contacts with other sections for most of the trade types found are those of the Rio Grande Glaze series.

Biscuit paste is light, and the temper is volcanic tuff derived from the Jemez Mountains. Originally the two Biscuit types were described as *A* and *B*, but more recently they have been identified by terminology conforming to Southwestern standards. Type *A* is now known as Abiquiu Black-on-gray, and may be identified by the fact that painted designs are found only on the insides of bowls. Type *B* is now called Bandalier Black-on-gray, and the painted design is found both on the inside and outside of bowls. Both were represented at Pecos Pueblo and, through studies made there, first achieved notoriety and the name Biscuit. Sites associated with the first type are small compact pueblos; those of the latter type are large villages.

At sometime during the thirteenth century a definite Mesa Verde invasion of the Rio Grande took place. This extended from the Mesa Verde on the northwest to about Albuquerque, and south beyond Mount Taylor to the Datil Forest. Pueblos were constructed of a good coursed masonry, and both these and the pottery are definitely Mesa Verde in character. Associated pottery types are St. Johns Polychrome and Tularosa Black-on-white. These Mesa Verde pottery types, and the culture, influenced the development of the southern half of the northern Rio Grande area, but to the west were subsequently engulfed by the development of the Little Colorado red pottery series.

Probably as a result of this Mesa Verde influence in the Rio Grande valley Galisteo Black-on-white developed. This is often so like true Mesa Verde Black-on-white that it is very difficult to separate the two types. The paste is hard but contains a coarse temper and gives an angular fracture. The surface is covered with a hard glossy blue-gray slip, which sometimes is crackled. The forms are largely bowls. Associated undecorated pottery is smeared over indented corrugated types.

Houses of this culture are of both coursed and uncoursed stone or of adobe. They are in the form of pueblos with plazas and date sometime after about A.D. 1250.

Restricted to the Jemez River area was another distinctive type of pottery, Jemez Black-on-white. The paste is gray, with fine to coarse translucent particles of temper, and has a thick white slip. The paint of the decoration is black to gray. This type grew out of Santa Fe Black-

on-white but is later. Houses are built of shaped tufa blocks or adobe, and are true pueblos with plazas of a general late Rio Grande Type.

As has already been suggested in the southern part of the state, Basket Maker III and Pueblo I horizons are represented by influences derived more or less directly from the Chaco Culture. Here, however, the plain associated types are of a basic southern brown ware. Very few or no northern coiled types are found in these sites. It is for this reason that the mountain section to the west has been stressed as one of the most important sections to be traced out and the pottery types studied. This is the region between the two states of Arizona and New Mexico where the Mogollon and Upper Gila plain and corrugated types have never been adequately studied and described. The genesis, descriptions, and names of these types are now badly needed.

San Marcial Black-on-white has already been mentioned as belonging to this section. It is suggestive of other Basket Maker III types but is often slipped, and on the whole designs are more of a transitional Basket Maker III-Pueblo I style. Associated types are a plain brown and a bright red slipped and polished type which is rarely smudged.

Along the Rio Grande from about Albuquerque to include Socorro, and west to near Grants, Socorro Black-on-white is found in some abundance. It was derived from Chaco and is apparently of about a Pueblo II cultural level. The paste is gray with fine temper and has a thin white or gray slip. The surface is not highly polished, having more the appearance of a mat finish. The design is in a good black, grading to a reddish brown color, and much use of a very fine hatching of excellent draftsmanship is characteristic. To the northwest towards Grants it grades into a more definitely Chacoan type.

Los Lunas Smudged developed in roughly the same area and at about the same time. The paste is sandy, reddish, and friable. Rarely a slip was used. Interiors of bowls are smudged black and polished, and the outer surfaces have very thin, even, regular coils, with some incised or punctate patterns. Some jars have neck coils only. Associated with these pottery types are sites with only a few surface rooms.

The culture of the area occupied by Socorro Black-on-white shifted to the Rio Grande proper, abandoning the area to the west, and developed a Chupadero Black-on-white type of pottery. The area of greatest concentration of this type was from the Rio Grande east to about Santa Rosa. In several respects it is strongly reminiscent of Tularosa Black-on-white, particularly as regards the use of balanced solid and hatched

areas. Those areas which are not decorated were crudely finished by being brushed or scraped. Designs are in black grading to a red-brown.

Associated with this pottery are coiled and rubbed-corrugated brown types of southern affinity. The houses are straggling pueblos of both stone and adobe with a suggestion of a plaza arrangement.

In the western part of the state Zuni and Little Colorado glazes were at this time assuming a position of some importance, and in an effort apparently to copy these glaze types Los Padillas Glaze Polychrome was produced. This replaced Galisteo and Chupadero Black-on-white and gave rise to the well-known Rio Grande Glaze series. It had a center in



Pecos Pueblo appears only as a large mound of crumbled masonry walls. It is in the eastern periphery of the Southwest.

the Rio Grande south of Albuquerque. It was much varied in styles and was obviously an intermediate form between the Zuni and the Rio Grande Glazes. The paste contained crushed rock or sherd temper, and vessels had a red slip with dark glaze paint and a mat white paint for the designs. Sites which contain this type are largely made up of black-on-white types.

From this developed the six well-known Rio Grande Glaze types. The area occupied by these true Rio Grande Glazes was that along the Rio Grande from about San Marcel to Santa Fe. The series is essentially

Pueblo IV in character but existed into the Historic Period. The houses associated with these types are large pueblos.

The Rio Grande Glaze series was originally made up of Glazes I to VI, but these have more recently been renamed. Like the glaze types of the Zuñi area a great many color combinations and styles are found, in confusing admixture, and it was soon realized that rim forms constituted the best basis of distinction. As a result each one of the six major groups may be identified by a distinctive rim form. Although a considerable group of type names is now in use those listed below are the ones most commonly found. For a complete and detailed discussion of this group reference may be made to *The Pottery of Pecos*, Vol. II.

Glaze I, Agua Fria Glaze-on-red and Cieneguella Glaze-on-yellow. Both these types have direct rims either squared or rounded.

Glaze II, Largo Glaze-on-yellow and Largo Glaze Polychrome, the latter with a red exterior decoration. Both have an expanded and rounded rim.

Glaze III, Espinosa Glaze Polychrome, with an angular or outflared and squared rim.

Glaze IV, San Lazara Glaze Polychrome, which has a deeper expanded and rounded rim.

Glaze V, Pecos Glaze Polychrome, with a very thick and deep interior expanded and rounded rim.

Glaze VI, Katyiti Glaze Polychrome, with a deep exterior expanded and somewhat squared rim.

Surveys which have been made in the lower portion of the Rio Grande valley in the vicinity of El Paso indicate sites of a time range from about A.D. 1100 to 1450. They are poorly represented, usually by surface sherd areas and a few house remains. Several divisions may be made. Those along the Rio Grande valley proper located on low terraces are traceable by sherd areas only. Basin sites have widespread sherd areas, sometimes of several miles' extent, and show distinct indications of house remains. There are also tanks, natural springs, and other points where travelers apparently stopped, and these are usually marked by pictographs and a few sherds. The fourth locations are in the highlands and consist of sherd areas and almost always house outlines.

Pottery types found here consist of Chupadero Black-on-white, which has already been described. This type in the form of bowls often shows very flat bottoms, as though the base was modeled and then the sides put on it, and this character may also be noted in jars. As has been previ-

ously stated it is apparently related in decoration to Tularosa Black-on-white. A second type is El Paso Polychrome, which has a coarse paste with sand and carbon inclusions as temper. It is slipped brown. Bowl interiors have a black and red design while exteriors remain only brown though they may be slipped or unslipped. There is also a heavy plain type which is brick red and contains much sand temper. Mimbres Black-on-white, largely with only geometric decorations, was a very common trade type. Casas Grandes types were also found here in some abundance, as were the various Gila Polychrome types.

This represents what appears to have been a distinct cultural province, which may be called the El Paso district. The ceramics are definitely Pueblo derived, but there appears to have been a local cultural base. The culture is essentially of a Pueblo II to a Pueblo IV stage when it died out and the area was abandoned.

In the country about the Guadalupe Mountains in the southeastern part of the state, a general survey and some excavations have been made. Here several types of sites have been found and examined, and an interesting cultural mixture reported.

Campsites were located in the open, usually in sand dunes where the blowing away of the sand exposed firepits but no houses. Sometimes a great number of firepits were found in one place. Pottery consisted of Chupadero Black-on-white, El Paso Polychrome, and related basic brown forms. Flat sandstone metates and one-hand manos were in use. A few burials were located but they were usually quite fragmentary.

What has been termed "midden circles" were located, widely scattered throughout the area, some of which were associated with sites. These have been commonly called "mescal pits," but they were probably not of such primary use. They consisted of piled-up circles of fire-broken and burned stones, intermixed with which were found the bones of food animals. In some instances there was evidence of a fire on the old ground surface in the center of the circle. Although pottery was rare, Chupadero Black-on-white, El Paso Polychrome, and El Paso Brown were all represented. Metates were apparently absent, but mortar holes were found. Other traits were similar to those of the campsites.

Small rectangular cairns of stones, the use of which is thus far unknown for they did not serve as burial places, were noted. Low stone walls placed in the form of circles of varying size were also found; these

may have served as tepee rings, but their great variation in size would seem to preclude such a possibility.

The most interesting sites examined were a series of caves. Some of these served only as burial sites; others were definitely domiciliary. Both cremations and inhumations were found in them, at least some of the inhumations being flexed. The physical types appertaining to these and the other sites examined here were found to be very mixed, some being long headed, others medium headed, and still others broad headed.

Food appears to have been largely vegetable, mescal being the most abundantly represented. No evidence was found of corn or mesquite beans. Of animal foods mule deer and antelope were the most common, while rabbits were surprisingly enough not well represented.

Pottery consisted largely of Chupadero Black-on-white, El Paso Polychrome, and plain brown types.

A great variety of basketry, mostly coiled, was in use. Matting of checker, twilled, and twined types was also abundant. Cords made of yucca fibers and a cottonlike material were common. The yucca cord apparently was used largely for game nets. Sandals, mostly of wicker-work type, were found.

Both fur cloth and skin robes were widely in use. A few tubular stone beads were found, and several atlatls and atlatl darts, as well as bows and arrows, and one fragment of a grooved club. Digging sticks were also a part of this culture.

The total culture is very suggestive of a late Basket Maker stage, but it also shows some modified Pueblo characters. Unfortunately the cave material was so mixed that no stratigraphic studies were possible. As this peculiar culture mixture is not now identifiable with any particular region it may provisionally be considered typically southeastern New Mexican.

In this very rapid review of New Mexico an attempt has been made to show only a general development of historical processes. Details of cultures have been given only for those areas which previous easily available literature has not covered. The large, well-known, well-reported, and often-described sites have not been mentioned but may be found described in detail in the reports and books listed in the general bibliography. It is for this reason that no particular attention has been given to such an important site as Pecos in the eastern periphery.

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Chapter XXV

GENERAL SUMMARY

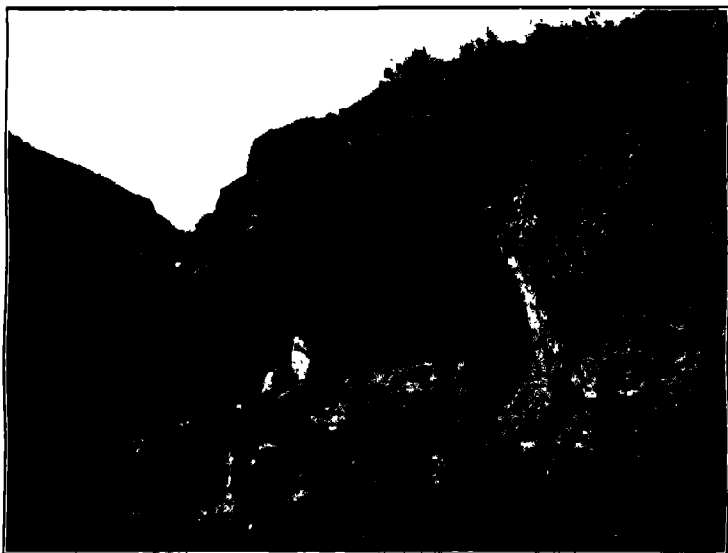
The cultures of each of the periods of the larger groups having now been discussed in some detail and summarized, it is possible to examine and evaluate all of them as a whole. Three points may be immediately pointed out in such a review of Southwestern cultures. First there are at the most two basic cultures from which the rest appear to have developed. Second, there are also two important disruptive periods in which cultures migrated widely and intermingled. Third, a general historical review of the several cultures will more clearly demonstrate the relationships of these groups.

In recalling all the preceding portions of this book it will be seen that two basic influences stand out most clearly. The first of these is the Cochise Culture. It is the earliest clearly understood culture found in the Southwest proper. Present information indicates that the Cochise developed more or less directly into the Mogollon Culture, which apparently was in its earliest portion a very strong culture with wide-spread influence on other people in the Southwest. Hohokam probably developed more or less directly from this early Mogollon influence, but very quickly embellished it with features developed locally in the Gila area to give it a distinctive caste all its own. This Hohokam is the culture found to be characteristic of the desert area.

Mogollon also appears to have strongly influenced the cultural history of the plateau area, not only early but continuously until it had in turn been overshadowed by Pueblo development. Pueblo Culture was most likely created by a combination of features taken from Basket Maker and Mogollon, but was fed by further influences from both Mogollon and Hohokam. At the present time it would seem that Patayan Culture was at least in part, and possibly basically, derived from Hohokam Culture.

If all this historical reconstruction is subsequently proved to be ac-

curate, the basic influence from which these groups sprang may be traced back to Cochise Culture. From this came Mogollon, which developed regionally to Hohokam and combined with the Basket Makers to produce Pueblo. From the recent work at Winona Village near Flagstaff it becomes increasingly clear that Hohokam also largely contributed to the later development of Pueblo Culture. To the west, Hohokam probably laid the base upon which Patayan Culture built, again as a regional differentiation.



The lower Tonto cliff dwelling in the Roosevelt Lake area. Such structures are found throughout the mountain area wherever natural caves make them possible. Most may be ascribed to the Salado Culture.

The second culture which now appears to be distinctive, and not genetically descended from any other in the Southwest, is Basket Maker. Although there are many similarities between Basket Maker and Mogollon Cultures it is the feeling of the writer that these are more a result of similar economies than identities of people. It is quite likely that Basket Maker Culture represents only a Southwestern variation of a basic widespread general culture in North America, although many more definite comparisons are needed before this postulation may be definitely established. From the Basket Maker Root in the plateau area

grew the later northern developments. Combined with Mogollon and influenced by Hohokam it gave rise to Pueblo. This culture enjoyed a remarkable rise in importance, and soon was so strong that it had spread into the desert section, as well as into the Rio Grande valley to the east.

From these two basic cultures it is now felt the rest grew. They did not develop alone, unmodified, in isolation, but almost certainly with many additions gleaned from far and wide. Mexican influences have already been pointed out in typical Hohokam Culture. More recently Dr. Mera has found definite Woodland traits in northern New Mexico, which were probably derived from somewhere in north central United States or southern Canada. These contributions to Southwestern culture may now be demonstrated, and as other areas are more carefully studied more influences will probably be found.

Next to basic influences upon which culture has been built the archaeologist is interested in disruptive or important events which have contributed to the history of the group being studied. When the nature and causes of such events are understood much of the functioning of human culture becomes clear. Two such periods of disruption may be indicated in the prehistory of the Southwest. For some time the nature and effects of the great drought have been known. This catastrophic event contributed to the abandonment of the San Juan drainage area and lent strong impetus to the southern shift of people and culture which had already been under way.

In an effort to demonstrate the importance of this event better, a chart, Fig. 161, has been prepared. This is a graphic representation of the last dates found at ruins as listed in Appendix I. Only the period from A.D. 400 to 1500 has been chosen, for it is this span which covers most of the well-known archaeological history. Each vertical column represents a period of fifty years, and each column is the relative height of the number of sites which show an end date falling within this period. The fact that more dates have been secured from sites at the more recent end of this series should be kept in mind as it is examined, for the columns are higher at the right than at the left of this chart.

In preparing the chart it was felt that the last dates at ruins would fall somewhere near the time of abandonment of the site, and that abandonment would indicate that the people were generally restless and moving about the country. These would also be periods of cultural disruption, for all factors sufficiently basic to cause population movements

would be important enough to alter culture. Two such peaks may readily be noted in the chart. The first of these became marked at about A.D. 1000 and reached its peak at about A.D. 1100. The second is of shorter duration and is clearly confined to a time near A.D. 1300.

Probably conditions had become markedly unsettled before the great drought actually set in, but there can be little doubt that it was the deciding factor in large population shifts. The drought itself was likely somewhat of the nature of a last cause, the straw which broke the camel's back, and not the only motivating factor. Large sites were widely established at this time, particularly in the San Juan, and the human cycle, already explained, would have been well advanced in most of them. If this were true many natural resources, particularly underground water, would be locally almost exhausted, or at least in a critical state. Other factors not now well understood were also probably contributing elements. This period, however, is one of the most important that may be pointed out in Southwestern history.

As has been suggested the earlier period seems to have had its origin about 1000 and to have reached its peak about A.D. 1100. Widespread causes which were behind this movement are much more difficult to explain. By A.D. 1000 Pueblo Culture had begun its southward expansion in the form of the Salado Branch. Present information, particularly that gleaned at Winona Village, indicates that this was not a one-directional culture advance, but was really an exchange. At this site reciprocal influences were certainly felt between the north and south. Here movements of people may be explained by the eruption of Sunset Crater, which, once the cinder mulch had been anchored above the old clay soil, formed an ideal agricultural area. In fact it had such great drawing powers that people flooded into this small area from all sides. It appears that here was one of the major gateways of exchange of ideas between the basic physiographic and cultural areas

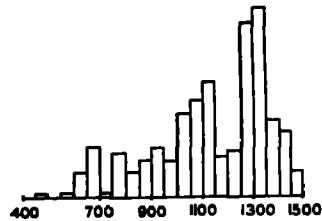
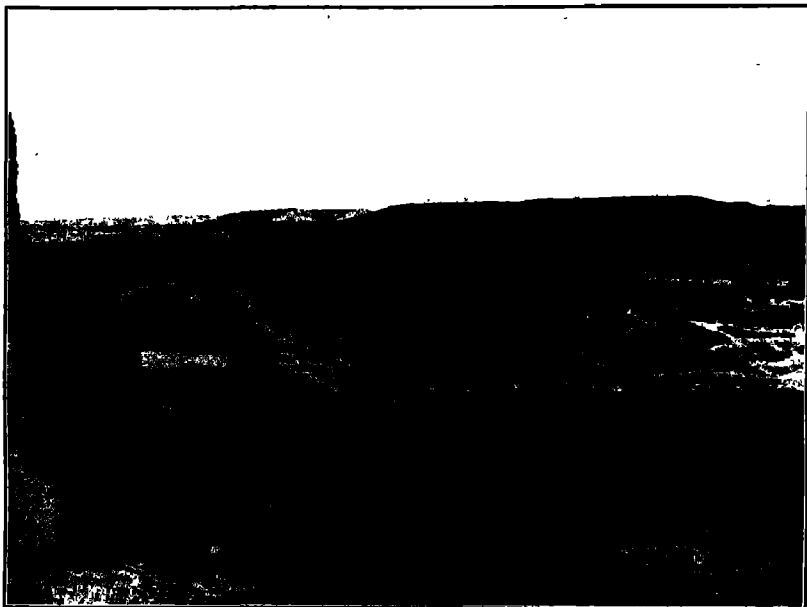


FIG. 161. Chart showing the last dates of dated sites which fall between A.D. 400 and 1500. The data from which this chart was built are all included in the list of dates in the tree-ring chapter. End dates have been grouped by fifty-year periods and the numbers indicated by the relative heights of the columns. The tallest column, from 1300 to 1350, represents twenty-nine sites whose latest dates fall into this span. Two peaks may be noted in this chart, one at about A.D. 1100 and the other at about A.D. 1300.

of the Southwest at this time. Too little information is had on other areas to point out similar influences.

The many sites now abandoned would certainly indicate that it was a period of general restlessness. Such a situation may best be explained by widespread contacts with other groups. It has already been indicated that expansion was taking place. Populations were increasing radically,



Aztec Pueblo in northwestern New Mexico is one of the very large sites of this section. A kiva is shown in the foreground. Walls are thicker and masonry less well laid than in the Mesa Verde sites.

and cultural development was very uneven regionally. All these factors probably combined to form the beginning of a unification of cultures and the creation of what is often referred to as a general Southwestern pattern. Regional variation certainly existed after this time, but it was not so marked as it had been previously. It is the cultures which existed after about A.D. 1100 that are generally thought of as truly Southwestern, for it was largely after this date that the pueblo, widespread pottery design similarities, elaborate weaving, and a great many other traits are to be found best represented.

Similar influences were at work in northern New Mexico. In fact the northern Rio Grande is in many respects parallel to the history of north-eastern Arizona, although in many others showing an apparent slight lag.

By way of an aid to the review of the prehistory of the Southwest, a second chart, Fig. 162, has been prepared. This indicates the culture centers and areas of influence which existed at the various periods indicated. At the earliest period two cultures are now known to have existed. Possibly the earliest of these is the Little Colorado River Culture, in which stone objects of human manufacture have been found widely scattered over the Tolcheco gravels of the river terraces. This culture may be very early or quite late, but so far as it is now known does not show any direct relationship to other groups. Certainly at 8000 B.C. the Cochise Culture was flourishing in the southeastern corner of Arizona. Material objects of human manufacture are here found associated with extinct animal forms. There is much evidence that this very old gathering and hunting group gradually developed into the Mogollon Culture.

At the time of Christ there was a serious settlement in the upper and middle portion of the Gila drainage area. At this date Hohokam and Mogollon were not distinctly separated but showed many identities of culture. Large and impressive houses were built, a very fine undecorated pottery was made, stone carving was well developed, and in general it was a relatively high culture. This was about the period when Snaketown began its existence. To the north in the plateau area some culture probably existed, but none has now been definitely isolated and identified. It is quite possible that the dates suggested for Basket Maker II stage of culture will be found to have been placed too late, and that this culture may be subsequently extended back to about this time.

By A.D. 400 Basket Maker II Culture was well represented in the San Juan drainage area of northern Arizona. It was a distinct culture easily recognizable by many characters. Economy was about equally divided between gathering and the beginnings of an agriculture. Much interest was shown in certain traditions of work which were markedly different from those of the Pueblo stages found in later periods in this section. In southern Arizona Hohokam and Mogollon had become much more differentiated. Pottery types showed more variation between the two groups, and divergent tendencies were already manifest. The Hohokam house was large and shallow; the Mogollon house was on the whole smaller and deeper.

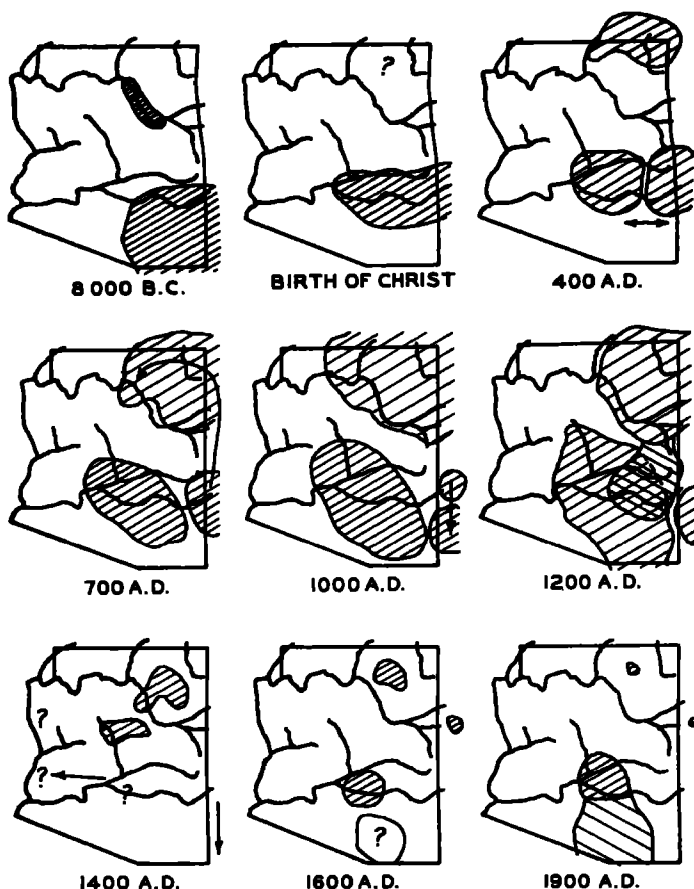


FIG. 162. Brief diagrammatic history of archaeological Arizona. At about 8000 B.C. the Little Colorado River terrace people were in the north, while in the southeast was the Cochise Culture. At A.D. 1 no culture is known from northern Arizona, while early Mogollon was established in the southeastern corner of the state. By A.D. 400 early Basket Maker Culture had become established in the north, and the mutually influenced Mogollon and Hohokam Culture in the south. At A.D. 700 the Basket Maker was changing to Pueblo in the north, largely as a result of Mogollon influence, while Hohokam had become definitely isolated from Mogollon. At A.D. 1000 Pueblo Culture was well established in the north, Mimbres had developed from Mogollon, and Hohokam Culture was highly developed. By A.D. 1200 the flourishing Pueblo Culture had sent a southward extension, the Salado Culture, south to the Hohokam, and the Mimbres was flourishing. At A.D. 1400 the Pueblos were represented by the Hopi Indians in the north, but nothing is definitely known of the south. By A.D. 1600 the Hopi and Zuni Indians were well established in small areas to the north, and the Papago and Pima Indians in the south. At A.D. 1900 the Hopi and Zuni were occupying their present small areas, in the south the Pima and Papago Indians were well established.

By about A.D. 700 both Hohokam and Mogollon had thoroughly established themselves as independent groups and at this time Hohokam was in the lead culturally. Both had stabilized and set the patterns of their future courses. Although Hohokam was probably very strong it seems to have been more isolated, as regards the plateau, than Mogollon, for at about this time there is some evidence of Mogollon influence in this area. To the north Basket Maker Culture had evolved to a Basket Maker III stage. This in many characters was similar to, but advanced from, Basket Maker II. From the small amount of evidence at present available it appears that Mogollon people actually invaded this area to introduce new ideas and new blood, and to lay the stage for Pueblo development. *That this took place very quickly in the next period cannot be denied.* Probably at the same time some Basket Maker traits moved southward into the Mountain area.

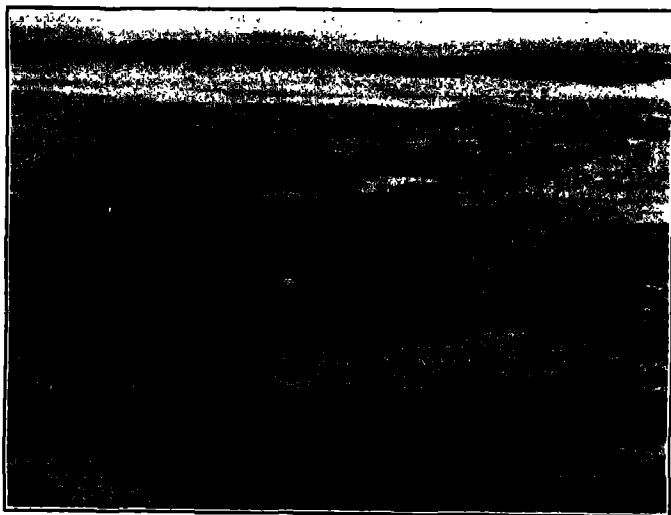
By about A.D. 1000 Pueblo Culture had become well developed in the north, with all major features so characteristic of later periods. Mogollon had definitely shrunk both in influence and area and from it to the south Mimbres Culture had developed. At the same time Hohokam Culture reached about its peak in many traits. Hohokam influence was being exerted on the Pueblo Culture to the north, as is indicated by the finds at Winona Village. Pueblo Culture also began its southward expansion at about this date in the form of the earliest manifestation of the Salado Culture. This had spread thinly over the Upper Gila and Salt valleys.

At A.D. 1200 Pueblo Culture was well established and generally balanced throughout most of the plateau. That it was the dominant culture at this time or shortly after is testified to by the spread of Salado in some strength throughout the Gila and Salt area. Mimbres Culture was still in existence but was beginning its southward expansion. Hohokam Culture, though high, was feeling the effects of the advancing Salado group, and its eventual decline was forecast.

By 1400 stabilization of cultures had taken place after the effects of the great drought. Pueblo Culture had considerably decreased in area, and had split into several regionally and somewhat culturally separable groups. One of these was located in the Verde valley where contributions from both the plateau and mountain areas seem to have been combined. Just what the situation in the Gila drainage area and in the Colorado River area was at this time remains problematical. Recent work on this problem will probably shed some light on it in the near future.

At A.D. 1600 the picture is much clearer, for it falls within the span

of recorded history. The Pueblo area in Arizona had been further reduced and was occupied by the Hopi Indians. The Zuñi Indians had been sufficiently differentiated now both culturally and areally that they are shown separately. Other Pueblo groups in New Mexico had a similar development. To the south the Pima Indians were well established in the Gila and Salt area, and the region south of them was possibly being invaded by the Papago Indians. A distinct divergence of culture is thus found once more well marked between the two sections.



Crack in the Rock Ruin is in the desert section near the Little Colorado River. Houses were built of sandstone or limestone blocks.

By A.D. 1900 the present situation was established. In the plateau the Hopi area had been reduced to its present size, as had the Zuñi. The Pima Indians were established over about their original area, and the Papagos were well entrenched to the south.

Throughout this review discussion it should once more be recalled that there are great areas about which little or nothing archaeological is known. This would account for the large blank spaces shown on the accompanying series of maps. As more complete and careful work is done in these sections the relationship of the various cultures already outlined will become much clearer. That influences and counterinfluences have been very marked throughout all archaeological history must

also not be forgotten, so that certainly no such simple picture as that just painted ever existed.

However, a few very broad generalizations may now be drawn. From all present indications Mogollon Culture was the first well established and highly developed culture in the southern mountain country, and the first strong influence in the development of the Southwest. Hohokam Culture was the next to rise to importance, and soon in fact overshadowed that of Mogollon. It also enjoyed a very distinctive and strong culture of far-reaching influence. This was followed last by the rapid rise of Pueblo Culture to a point of domination which is still being enjoyed.

It is toward such an historical picture as that just outlined, though much more complete, that the archaeologist strives. From such studies it is hoped that object lessons may be pointed out which will help us better to understand ourselves, and so control our own actions in the future more intelligently.

APPENDIX I

LIST OF MOST OF THE DATED RUINS IN THE SOUTHWEST

Spring of 1939

Alamo, Pueblo III, 1245-1267+X.
Alkalai Ridge, B.M. III and Pueblo I, 770±10.
Allantown House 4/32, Pueblo I, 857±5-888±15.
Allantown House A1. (Roberts structure 12), 844-918.
Allantown Kiva 32/G, Pueblo II, 994±20-1011±2.
"Amoxiumqua," Pueblo IV, 1505±3.
Aqua Fria Schoolhouse, Pueblo III and IV, 1355-1364+X.
Arrowhead or Glorieta, Pueblo IV, 1370-1392.
Arroyo Negro, Pueblo II, 1127-1144.
Awatovi, Pueblo IV, 1332+X-1602+X.
Aztec Ruin, Pueblo III, 1110-1121.
Balcony House, Pueblo III, 1190-1272.
Bat Woman, Pueblo III, 1275.
Bennetts Peak, New Mexico, 675+X-857.
Betatakin, Pueblo III, 1242-1277.
Black Mesa, Kokopki, Pueblo II, 1074-1078.
Broken Flute Cave, B.M. II and III, 354+X-647.
Buzzard House, Pueblo III, 1272.
Calamity Cave, Pueblo III, 1275.
Cave 1 (Morris), B.M. III, 654-655.
Cave 2 (Morris), B.M. III, 626-669.
Cave 6 (Morris), B.M. III, 553-674.
Cave 7 (Morris), B.M. III, 666-674.
Cave 8 (Morris), B.M. III, 637-666.
Cedro, Pueblo III and IV, 1345-1394.
Chakpahu, Pueblo III, 1377-1390+X.
Chamisalocita, Pueblo III, 1314-1322.
Chaves Pass, Pueblo III and IV, 1381.
Chetro Keti, Pueblo III, 911-1119.
Chihuahua H:11:1, Pueblo IV, 1374+X.
Citadel, Pueblo III, 1192-1260.
Cliff Palace, Pueblo III, 1175-1273.
Colorado B:9:1, B.M. III, 543+X-590+X.
Colorado B:9:2, B.M. III, 650.
Cundiyo, Pueblo III and IV, 1337-1343+X.
Elden Pueblo. Pueblo III, 1162+.
Fewkes Ruin J, Lomoki, Pueblo III, 1192.
Five Kiva House, Utah, Pueblo III, 1243-1244.
Frijolito, Pueblo IV, 1447.
Gila Pueblo, Pueblo IV, 1345-1385.
Gobenador Canyon, Pueblo V, 1732±3-1752±10.
Grand Gulch Cliff Dwellings, Pueblo III, 1132-1135.

Hawikuh, Pueblo IV, 1381-1480
 Hemenway House, Pueblo III, 1172-1184
 Howiri, Pueblo IV, 1412-1422±3
 Hospitabito, Pueblo III, 1229
 Hungo Pavi, Pueblo II and III, 941-1077
 Jug House, Pueblo III, 1066
 Kawaka, Pueblo III and IV, 1357-1495
 Kiatsukwa, Pueblo IV, 1614-1616
 Kiatuthlanna, Pueblo III, 1015±15
 Kiet Siet, Pueblo III, 1116-1286
 Kinbiniola, Pueblo II, 941-1124
 Kinchindi, Pueblo III, 1019-1042
 Kings Run, Pueblo III, 1028-1065±15
 Kinishba, Pueblo, Pueblo III and IV, 1238-1306
 Kinklizin, Pueblo III, 1084
 Kinnazinde, Historic, 1720-1804
 Kintiel, Pueblo III, 1255-1285
 Kinya'a, Pueblo III, 1097-1106
 Klag't Ioh, Pueblo III, 1112-1126
 Kokopnyama, Pueblo III and IV, 1269-1445
 Kokopki, Pueblo III and IV, 1269-1445
 I A 76 (Arroyo Hondo), Pueblo III, 1311-1316
 L A 136 (Jemez region), Pueblo IV, 1657-1661±3
 I A 309 (Galisteo Basin), Pueblo III, 1271-1331
 I A 515 (Pajarito Plateau), Pueblo III, 1304-1310±5
 I A 641 Capulin Ranger Stn., 1106-1107
 I A 653 Chupadero Ranger Stn., 1253-1256±4
 I A 654 Chupadero Ranger Stn., 1260
 I A 875 (Rio Puerco), Pueblo III, 1260±4-1265
 I A 1064 Star Lake, Pueblo V, 1710±1
 I A 1104 (Manzanitas), Pueblo III, 1278-1302
 I A 1225 Gallo Canyon, Pueblo III to IV, 1319±1-1366
 I A 1237 Three Rivers, Pueblo IV, 1335-1348
 I A 1684 Pueblo Canyon, Pueblo V, 1735
 I A 1687 Munoz Canyon, Pueblo V, 1751±10
 I A 1868 Gobernador Canyon, Pueblo V, 1732-1733
 I A 1869 San Rafael Canyon, Pueblo V, 1752±3
 I A 1871 San Rafael Canyon, Pueblo V, 1712±10
 I A 1872 San Rafael Canyon, Pueblo V, 1737±10
 Idder House, Pueblo II, 1061±5-1067±10
 Iamv, Pueblo III, 1261±5-1311±X
 Icyrt Kin, Pueblo III, 1011-1045
 Little Granary House, Pueblo III, 1259
 Llano (near Ios), Pueblo III, 1207-1210
 Loloma Ki, Pueblo III, 1278
 Long House, Pueblo III, 1181-1273
 Los Aguajes, Pueblo IV, 1457-1462
 Lowry Ruin, Pueblo II and III, 987+X-1104±1
 Medicine Fort, Pueblo II, 904-1063
 Mesa Verde (Earth lodge A), B M III, 612

Mindeleffs Ruin 15, Pueblo III, 1011
 Mocho, Pueblo II and III, 1185-1192
 Mogollon Village, New Mexico, 895+X-908
 Mound 20, Pueblo III, 1039-1045
 Mummy Cave, B M III, 348-702
 Mummy Cave (Cave 1), Pueblo I, 701-787
 Mummy Cave (late occupation), 1253-1284
 N A 192B, Pueblo II, 910-925
 N A 408, Pueblo II, 912-976
 N A 534, Winona (small site) Pueblo III 1246
 N A 862, " Medicine Cave Pueblo II 901+X-1061
 N A 863, Pueblo II, 1025
 N A 1238, Pueblo II, 926-1066
 N A 1244B, Pueblo I, 817-821
 N A 1531, Pueblo I, 708+X-855
 N A 1570 Pueblo II, 941-1046
 N A 1625B, Pueblo II, 879+X-1045+X
 N A 1625C, Pueblo I and II 777-947±10
 N A 1680 Pueblo II, 880-990
 N A 1814A Pueblo II, 907-927
 N A 1920B, Pueblo I, 860
 N A 1925B, Pueblo I, 843-859
 N A 1959, Pithouse Pueblo I-781
 N A 2001 Pueblo II 825-965
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 N A 2002A, Pueblo II, 914-1115
 N A 2542, Pueblo II, 1018
 N A 2551 Pueblo I, 685+X
 N A 2606 (Islet Canyon area), Pueblo III 1275
 N A 2630 Pueblo II, 1124-1140
 N A 2800 Pueblo I 680+X-792±
 N A 2798 Pueblo I, 710+X-927+X
 Nalakihu, Pueblo III, 1110+X-1189
 New Fire House, Pueblo III, 1259
 Oak Tree House Pueblo III 1112-1184
 Obelisk Cave B M III, 477-488
 Oraibi, Historic, 1370, Present
 Painted Kiva, Pueblo III, 1202
 Pecos Pueblo, Pueblo IV, 1318-1612
 Pena Negra, Pueblo III 1335-1337+X
 Penasco Blanco, Pueblo III, 898-1087
 Piedra Ruin (Colorado), Pueblo I, 774
 Pindi, Pueblo III and IV, 1217±2-1348
 Pinedale, Pueblo III and IV, 1150-1375
 Pine River Ruin, B M III 634+X
 Pithouse in Wash (near Pueblo Bonito), Pueblo I, 777±10
 Poshu, Pueblo IV, 1391, 1415+X
 Posi, Pueblo IV, 1375±25-1451+X.
 Prayer Rock Cave, Pueblo III, 1277
 Pueblo Bonito, Pueblo II and III, 828-1130

- Pueblo del Arroyo, Pueblo III, 1052-1101.
 Pueblo Largo, Pueblo IV, 1413-1450+X.
 Pueblo Pintado, Pueblo III, 1060.
 Puye, Pueblo IV, 1507-1565±3.
 Red Rock Valley, Caves 1, 2, 6, 7, and 8, 690+X-759.
 Riana Ruin, Pueblo III, 1335-1336.
 Rincon Red House (2), Pueblo III?, 1126-1130.
 Rowe, Pueblo III, 1311±5.
 Rubbish Ruin (1), Pueblo III, 1257.
 Ruin 16 (Mesa Verde), Pueblo III, 1174-1265.
 Ruin 251, Pueblo IV, 1390.
 Ruin 309, Pueblo IV, 1310±5.
 San Cristobal, Pueblo III and IV, 1417-1442±5.
 San Juan Canyon, Pueblo V, 1723±1-1727±1.
 Seshukwa, Pueblo IV, 1598.
 Shipaulovi, Historic, 1550±15 to present.
 Sholow, Pueblo III and IV, 1174-1382.
 Shungopovi, Historic, 1408 to present.
 Sichomovi, Historic, 1435±10 to present.
 Sierra Ancha Ruins:
 C:1:8, 1322-1329. C:1:38, 1340.
 C:1:14, 1295-1312. C:1:40, 1303-1347.
 C:1:16, 1278-1324. C:1:44, 1310-1330.
 C:1:21, 1299-1313. C:1:45, 1309-1322.
 C:1:25, 1248-1323. C:1:46, 1323.
 C:1:30, 1299-1308. C:2:8, 1326-1348.
 C:2:11, 1340.
 Site 25 (Morris), La Plata, Pueblo I, 836-845.
 Site 33 (Morris), Johnson Canyon, B.M.-Pueblo I, 831.
 Sliding Ruin, Pueblo II, 833-957.
 Solomon, Pueblo II?-1089.
 Spring House, Pueblo III, 1115.
 Spruce Tree House, Pueblo III, 1019+X-1274.
 Square Tower House, Pueblo III, 1194-1259.
 Starkweather Ruin, New Mexico, 927.
 Step House (Earth Lodge), B.M. III, 625.
 Swallows Nest, Pueblo III, 1249.
 Tecalote, Pueblo II and III, 1170-1205+X.
 Te'ewi, Pueblo IV, 1397-1424±1.
 Tocita, Pueblo III, 1126.
 Tonto Monument (upper), Pueblo IV, 1346.
 Tseh Tso, Pueblo II, 922.
 Tshrirege, Pueblo IV, 1480±10-1581±1.
 Tsinklitzin, Pueblo III, 1111.
 Tsiping (Canones), Pueblo III and IV, 1311±5-1328±5.
 Tunque, Pueblo IV, 1431-1505±5.
 Turkey Hill, Pueblo III, 1168-1278.
 Turkey House, Pueblo II and III, 977±3-980±6.
 Tusayan Ruin (G. Canyon), Pueblo III, 1170+X-1205+X.
 Twin Cave, B.M. III, 605-667.

Twin Caves Pueblo, Pueblo III, $1110 \pm X - 1280 \pm 2$.
 Tyuonyi, Pueblo IV, $1423 \pm X - 1513$.
 Una Vida, 847-1048.
 Unshagi, Pueblo IV, 1402-1605.
 Vandal Cave, B.M. III, 608-683.
 Walnut Canyon Cliff Dwellings, Pueblo II, 888-1094.
 Walpi, Historic, 1417 to present.
 Water Canyon Ridge Ruin, Pueblo IV, 1310 ± 5 .
 White House Pueblo, Pueblo III, 1060-1275.
 White House Cliff Ruin (1), 1061 (provisional).
 White Mound, B.M. III and Pueblo I, $671 \pm X - 802$, and 1084 ± 2 .
 Wijiji, Pueblo III, 1027.
 Wingate 11:47, Pueblo I and II, $806 \pm X - 892 \pm X$.
 Wingate 11:49, Pueblo I and II, $863 \pm X - 880$.
 Winona Pithouse, Pueblo III, 1100-1131.
 Wupatki, Pueblo III, 1073-1205.

In applying these dates from individual ruins to archaeological problems care must be exercised. Some dates, because they are the outside dated ring which was found on the piece, and not the actual bark, or cutting date, may be earlier than the construction date of the site or room. In others, such as the White House or Pueblo Bonito, apparent long periods of occupation actually represent two occupations of the site by different people. Such exceptions will be allowed for in the application of these dates.

This list of dates is a compilation of the reports of various individuals, often taken from several sources, so that it is possible for individual sites to be listed under two headings. Those sites with which the writer is closely familiar have been corrected in this respect, but for others, particularly those with numerical designations, there may be some slight overlapping. The chief contributors have been: A. E. Douglass, Emil W. Haury, W. S. Stallings, Jr., H. T. Getty, Florence Hawley, J. C. McGregor, and Carl Miller. Although many other reports have been drawn upon, the two chief sources have been the *Tree Ring Bulletin*, now published at the University of Arizona, Tucson, Arizona, in which it is hoped that all dates thus far secured will eventually appear, and the *Pueblo Bonito Series Bulletin* 1. If these sources are examined, culture associations and dates will be found more fully explained.

APPENDIX II

DATED POTTERY TYPES

NAME	DATE A.D.	PERIOD OF ABUNDANCE
Coconino Gray	865 - 890	865- 890
Deadmans Black-on-white	875 -1130	1000-1100
Flagstaff Black-on-white	1100?-1250?	1150-1250?
Holbrook Black-on-white	900 -1130?	?
Kana-a Black-on-white	700-50 - 875	800- 850
Kana-a Gray	800 - 900	875- 900
Kayenta Black-on-white	?-1300	1272-1280
Kayenta Polychrome	?-1300	1272-1280
Lino Black-on-gray	500?- 750	650- 700
Lino Gray	500?- 750	650- 700
Medicine Gray	865 - 890	865- 890
Rio de Flag Brown	Pre- 750 -1100	750- 900
Sunset Red	1050 -1200 +	1130-1200?
Tusayan Corrugated	900 -1100±	900-1000
Walnut Black-on-white	1100?-1200 +	1150-1200?

The above types have been dated with comparative accuracy, on the basis of a great many dates derived from a number of sites.*

	A.D.
Adamana Brown	Pre-700
Bluff Black-on-red	Pre-1100
Citadel Polychrome	About 1115-1150
Deadmans Black-on-gray	Pre-700 to about 1040
Deadmans Black-on-red	About 750-900
Deadmans Fugitive Red	Pre-700 to about 1050
Elden Corrugated	Probably between 1125 and 1225
Fournile Polychrome	About 1350-1400
Gila Plain	Pre-700 to 1350
Gila Polychrome	About 1300
Gila Red	Pre-1200 to 1400
Gila White-on-red	Probably between 1200 and 1400
Jeddito Black-on-orange	Probably between 1200 and 1300
Jeddito Black-on-yellow	Probably between 1325 and 1600
Lino Fugitive Red	Pre-750
McDonald Corrugated	Probably between 1150 and 1250
Medicine Black-on-red	Pre-800 to about 950
Mesa Verde Black-on-white	Probably between 1200 and 1300
Mimbres Bold Face Black-on-white	950-1050
Moenkopi Corrugated	About 1075-1275

* For a more detailed consideration of this dating see *Bulletin 13*, Museum of Northern Arizona.

	A.D.
Mogollon Red-on-brown	Pre-900
Pinedale Black-on-red	Between 1200 and 1300
Pinedale Polychrome	About 1250-1325
Pinto Polychrome	Probably between about 1150 and 1250
Puerco Black-on-red	Post 950 and pre-1150
Salado Red	Probably between 1150 and 1250
Salado White-on-red	Probably between 1150 and 1250
San Francisco Red	Pre-700 to about 1100
Santan Red	About 900-1100
Sholow Black-on-red	Pre-1200
Sityatki Polychrome	Probably between 1400 and 1625
St. Johns Polychrome	1100-1200
Tonto Polychrome	About 1400
Tularosa Black-on-white	Probably between 1000 and 1200
Tusayan Black-on-red	About 850-1125
Tusayan Polychrome	About 1150-1300
Tuzigoot Black-on-gray	Probably between 1150 and 1425
Verde Black-on-gray	Probably between 1150 and 1400
Wingate Black-on-red	About 950
Winona Brown	1050-1150
Woodruff Brown	Probably pre-800

Although the dates of the second group of pottery types have been in part derived from tree-ring dates, many of them have been arrived at through a process of seriation. This will explain the prevalence of such terms as "about," "probably," "between," and "pre-."

APPENDIX III

BRIEF GLOSSARY OF CERAMIC TERMS IN COMMON USE

- Base.** Portion of vessel upon which it naturally rests.
- Body.** Portion of vessel from base to neck.
- Bowl.** More or less hemispherical shallow vessel without neck.
- Burnished.** A more or less metallic surface luster to pottery, given by rubbing the surface with a smooth object before firing.
- Carbon paint.** Black paint derived from carbonized organic material.
- Ceramics.** The art of making objects from fire-hardened earthy material.
- Coiled neck.** Vessel neck consisting of one continuous spiral of flattened clay coils.
- Corrugations.** Smoothed and flattened but distinct coils of clay.
- Design elements.** Not discussed here as they are taken up in their proper place under various pottery types, where they may best be illustrated by diagrams.
- Effigy.** Any vessel fashioned after a living object.
- Firing.** Process of baking clay by fire.
- Glaze.** A glassy surface coating applied to pottery.
- Globular.** More or less spherical in body form.
- Handle.** Portion intended to be gripped in the hand or by the fingers.
- Incised.** Removal of portion of the clay surface of a vessel, in lines, by means of a hard instrument before firing.
- Indented corrugations.** Finger-marked coils of clay on the surface of a vessel.
- Iron-Carbon paint.** Paint containing some iron pigment, as well as carbon.
- Ladle.** Dipper-shaped vessel. (See diagram, Fig. 17.)
- Leg.** Any long and comparatively slender projection which supports the body.
- Lid.** Any cover purposely designed to close an orifice.
- Lug.** Knoblike projection not large enough to be gripped in the hand. Often perforated.
- Monochrome.** Pottery of only one color.
- Neck.** Portion of vessel from point where line of body turns toward the vertical to the rim.
- Neck coils.** Rings of flattened clay coils about the neck of a vessel.
- Olla.** Vessel with a globular body and a short neck.
- Paste.** Material from which a pottery vessel is formed.
- Pitcher.** Vessel with cylindrical body, and more or less tall straight neck. (See diagram.)
- Polished.** Pottery surface smoothed by rubbing before firing.
- Polychrome.** Pottery decorated with three or more colors.
- Pottery.** A fire-hardened clay object.
- Rim.** Thickness of vessel wall at edge of orifice.
- Scraped.** Pottery surface which has been rubbed over with a blunt instrument before firing, thus removing some of the paste and leaving a slightly striated texture.
- Sherd (or shard).** Fragment of a broken pottery vessel.
- Slip.** External layer of clay, usually pigmented and visible, covering pottery. (Wash sometimes used as a synonym.)
- Smoothed.** Surface of pottery which has been rubbed, but not polished or burnished, before firing.
- Temper.** Non-plastic material added to the clay in making pottery. (Usually angular, and often visible.)
- Vessel.** Any container (in this discussion made of pottery).

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